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NO. 2 OF A SERIES ON HOW TO

Stretch a MULTIWALL Paper Bag

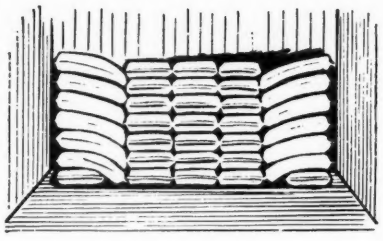
It is just good business to get the best possible use from your multiwalls. Here is one way to do it . . .

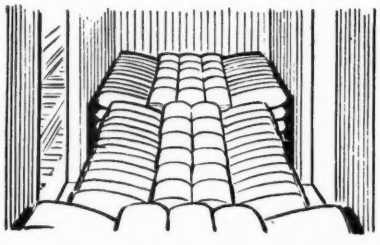
PROPER CAR LOADING

PREPARATION IS IMPORTANT

Cars should be clean, dry, and free from protruding nails or other projections. Remove all dirt, dust, rocks and grit from floor and walls. Remove loose nails and cover loose bolts with cardboard or several thicknesses of car liner. (Picture shows how to use straight-edge board to locate protruding nails, etc.)

Cover floor with good grade of car liner and put at least three thicknesses on door edges. Line walls, too, if they are in bad condition. Use asphalt-laminated paper to seal door cracks against dirt, rain, snow and cinders.





FOLLOW THESE LOADING RULES:

1. The car should be loaded so that the filled bags will not come in contact with side doors.

   a. Use a good grade of dunnage in the doorway or steel strapping covered with corrugated board.

   b. Follow proper loading patterns. (See illustrations.)

   c. Use retaining strips of special Scotch tape applied across the load, or steel retaining straps covered by one thickness of corrugated board.

2. Bags should be loaded tightly, solidly and flat, to minimize shifting in transit.

3. Balance the load so there will not be more weight on one end or side than on the other end or side.

There are, in general, three different methods of loading—crosswise, brickwall and lengthwise. The crosswise method is generally considered to be the most acceptable.

Loading in car doorways should be done in such a manner that this part of the load acts as a keystone between the loads in the ends of the car. (See illustration.)

Want the Whole Story?

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• • •

If you need cotton or burlap bags also, Bemis is your best source.

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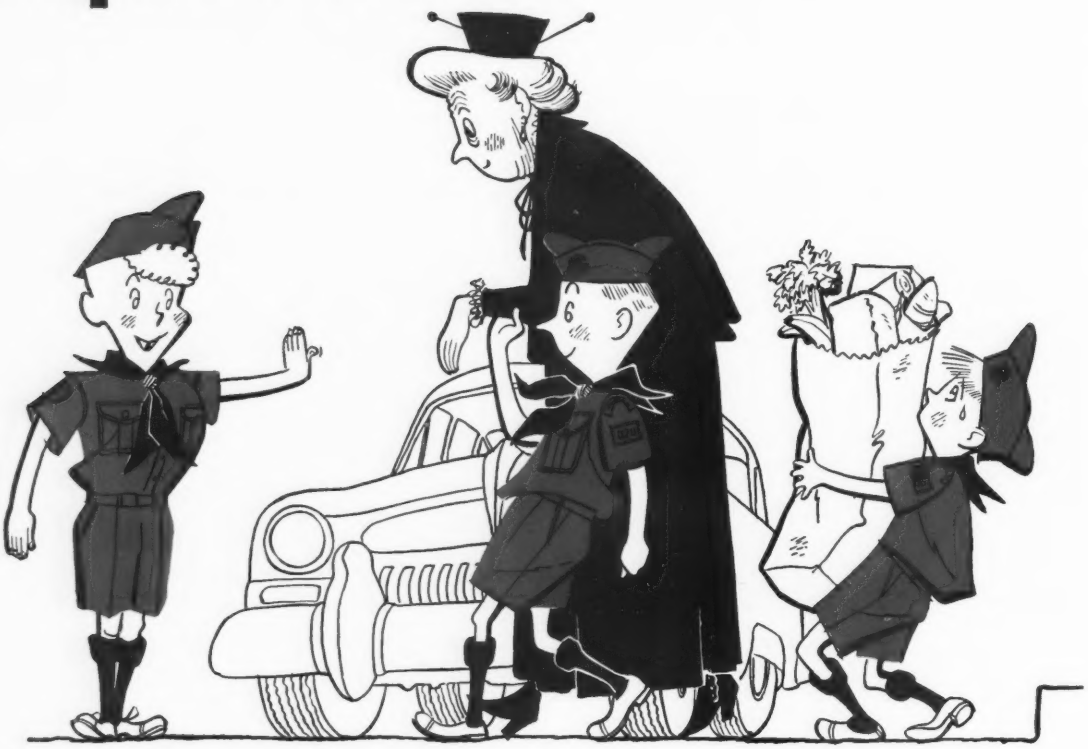

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Chemical Division • El Dorado, Arkansas

In this issue . . .

The pesticide business is going up in a cloud of smoke. At least, that's how things look when the new self-dispersing insecticide product "Mist-o-cide" is used. Manufactured by the Mist-o-cide division of Multiphase, Inc., the product has had amazing success to date. The operator just pulls a tab on the cardboard cylinder and in a minute clouds of insecticidal smoke billow up to the ceiling. The material space kills rapidly and has also a residual effect. It's described and illustrated on page 12.

Granulation of fertilizers in the United States is a relatively new process, at least on a large commercial scale. But in most European countries it is a common practice and has been developed to a great extent. Dr. M. Stemart, department manager at Enterprize R. & J. Moritz, France, describes equipment manufactured by his company for granulation of fertilizer. One big advantage of the system, described in the article starting on page 15 is that bagging and packing are easier.

Pesticide industry leaders from all over the country are meeting in San Francisco April 6–9 for the spring meeting of the National Agricultural Chemicals Association. Some big problems face the membership. For information on the convention, see the article on page 23 and the editorial comment on page 7.

Equipment for closing filled sewn gusseted open mouth multiwall paper bags was pioneered in the early thirties. Since that time, the industry has rapidly expanded. For a detailed account of multiwall paper bags—past, present and future—read the article by Noyes Baker on page 25.

Control of powdery mildew has been aided with the development of a material called Iscothan. It's a yellow wettable powder developed by Innis, Speiden & company, Inc. and is now being recommended for control of powdery mildew on flowers and some fruit. Development of Iscothan is described by Richard H. Barton in the article on page 31.

A new plant for production of superphosphate and mixed plant foods recently was put in operation by International Minerals & Chemical corporation at Fort Worth, Tex. A story on plant production may be found on the last page of this issue.

farm chemicals

Formerly
American Fertilizer & Allied Chemicals

Established 1894

PIONEER JOURNAL OF THE FARM CHEMICALS INDUSTRY

Vol. 115 **APRIL, 1952** **No. 4**

Contents

Cover Story

A few seconds before the cover photo was taken, a small tab was pulled on that "Mist-o-cide" carton. Development of the product, which gives clouds of potent insecticidal fog, is described in the article on page 12.

A magazine international in scope and circulation and devoted to manufacturers, mixers, and formulators of fertilizers and pesticides

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farm chemicals facts

. . . Briefly Noted

Large attendance was assured for spring meeting of National Agricultural Chemicals Association in San Francisco, April 6–9. Schedule for the big West Coast meeting includes reception Sunday and address by President Arthur W. Mohr the following day.

NFA President Russell Coleman recently urged state extension directors to stress need for early movement of fertilizer. **Dr. Coleman** reported excellent response to the request, which was made to expedite fertilizer sales.

Preliminary plans are being made by **NFA** for its June **convention** at Greenbrier Hotel, White Sulphur Springs, W. Va. Conference is set for **June 16–18.**

Died: George D. Chamberlain, vice president and secretary of Gulf Fertilizer company, Tampa, Fla., Feb. 27.

A **fertilizer section** was added to the Southern Safety Council at the Southern Safety Conference March 3, in Atlanta.

Mathieson Chemical corporation has acquired fertilizer division of **Tovrea Land & Cattle** company near Phoenix, Ariz. It will be the hub of Mathieson's new Agricultural Chemical Sales division, serving far west.

Carl W. Tuohey is new sales representative for **Hough** in eastern seabord states. A Purdue graduate, Tuohey joined Hough in 1950.

Acting manager of insecticides department of American Cyanamid is **Dr. Bruce D. Gleissner.** He replaced **Harry Longhorst,** who died in January.

Plant and animal studies with atomic energy research tools will be discussed at session of the Fourth Annual Oak Ridge Summer Symposium, set for Aug. 25–29. Title for the symposium is **"Role of Atomic Energy in Agricultural Research."**

Two new international corporations have been formed by Victor Chemical Works, Chicago, producer of elemental phosphorus and phosphates. **Victor Chemical Trading** corporation will handle sales in Western Hemisphere, **Victor Chemical International** corporation, sales outside the hemisphere.

Manager of phosphates and detergents sales for **Monsanto's** phosphate division is **Winthrop R. Corey.** His assistant is **James E. Crawford, Jr.**

A $1,400 grant to support a graduate assistantship in poultry husbandry has been made to **University of New Hampshire** by Monsanto.

"Process Progress" is a new NFA publication designed to keep fertilizer industry up to date on progress in fertilizer manufacture and processing.

Three personnel changes in **Pacific Guano** company: **George P. Bloxham,** assistant manager of Southern division; **Howard Conley,** assistant general manager of the company and **J. J. Bingham,** manager of Insecticide division.

Mangum Webb has been elected vice president of **Chemical Construction** corporation. He joined the firm in 1914, when it was founded.

Jaite company announces appointment of **Neil McClaman** as general sales manager. His office is in Chicago.

More nitrogen (seven per cent), and more potash (five per cent) will be available during 1951–52 season, **American Potash Institute, Inc.,** predicts, despite shortages of critical materials. Institute also forecast farm prices about the same as 1951 season.

Formosa, Korea and other Asiatic countries reportedly are turning to **Germany** for **chemical fertilizers** because Japan can't meet all the requirements.

L. J. Polite Jr. has been transferred to Diamond Alkali's Organic Chemicals division. He now is with sales staff of **Kolker Chemical Works, Inc.,** Newark, N. J.

Chase Bag has transferred **Eugene P. Alexander,** sales representative, from Cincinnati to Detroit territory.

Some $64 Questions

As members of the National Agricultural Chemicals Association meet at the big West Coast meeting of the organization in San Francisco, several important questions face them.

To a great extent, the same questions faced the members at their annual meeting last September in Spring Lake, N. J.

At that time, the Korean war was going full blast, with its many important influences on the pesticide industry being felt all over the country, and in many other lands.

The Delaney committee had heard testimony about the use of chemicals in foods, from industry and educational leaders in the Washington, D. C. area.

The problem of increased pesticide production for an expanding economy at home, for military purposes and for export to many foreign countries for use in protecting crops from the ravages of insects and disease was preeminent then. All these questions still are of prime importance as the NACA meets seven months later.

Naturally, the more than 400 association members who are expected to attend the meeting will want to know the present situation and outlook in all these phases of the industry.

Perhaps many of the problems will be aired in the keynote address at the meeting. Arthur W. Mohr, association president and president of California Spray-Chemical corporation will give the important opening talk, in which he is scheduled to report on NACA activities and progress since the last meeting.

Mohr and other speakers, listed in the FARM CHEMICALS article on the convention in this issue, are expected to shed light on the following important aspects of the pesticide industry:

1. What has been the progress of the industry since the September meeting? Has pesticide production, reported at more than one billion pounds in 1951, continued its upward trend? Last year Phillip H. Groggins, chief of the agricultural chemicals section, chemical division, National Production Authority, said industry personnel could make considerable savings in sulfur, benzene and chlorine by making certain economies in productions. Has the industry responded with real savings?

2. What about controls? Have government regulations on industry been kept at a minimum to insure unhampered progress? W. R. Allstetter, deputy director of the Office of Materials and Facilities, Production Marketing Administration, USDA, last year predicted that defense agencies would attempt to keep federal controls on pesticides at a minimum. It will be interesting to hear Allstetter's comments on controls when he speaks again at the San Francisco meeting.

Since last the NACA members met, some important testimony has been given—much of it by leaders in the pesticide industry—to the Delaney committee.

Many key statements were made at the West Coast hearings before the committee on the supposed dangers of the newer pesticides and on the effectiveness of existing regulations on the chemicals. FARM CHEMICALS recently commented editorially on a statement we thought answered those persons who are demanding more far reaching and powerful regulations on pesticides. That statement bears repeating for consideration of NACA.

It was made by Dr. Paul F. Sharp, director of the California Agricultural Experiment Station, who said, "When a control procedure is developed, a delay of even one year in obtaining permission for its use might bring ruin to a segment of our agriculture and lower the nutritional level of our population. . . . Is it not the case that the known hazard of lowering the nutritional level of the people of our country is much more serious and real than the remote chance that a small amount of residue may be present?"

3. Industry expansion. In September, J. Albert Woods, president of Commercial Solvents corporation, told the association the chemicals industry is committed to a four-billion dollar expansion this year. What part of that goal has been realized by pesticide manufacturers? Reports of construction and expansion, included regularly in this magazine, indicate the industry has made big strides toward expanding its physical assets for increased production so urgently needed.

What will be done to spur those residue tolerances so long awaited from the Food and Drug Administration? What about shortages of materials still plaguing the industry and industry research to develop new and better chemicals?

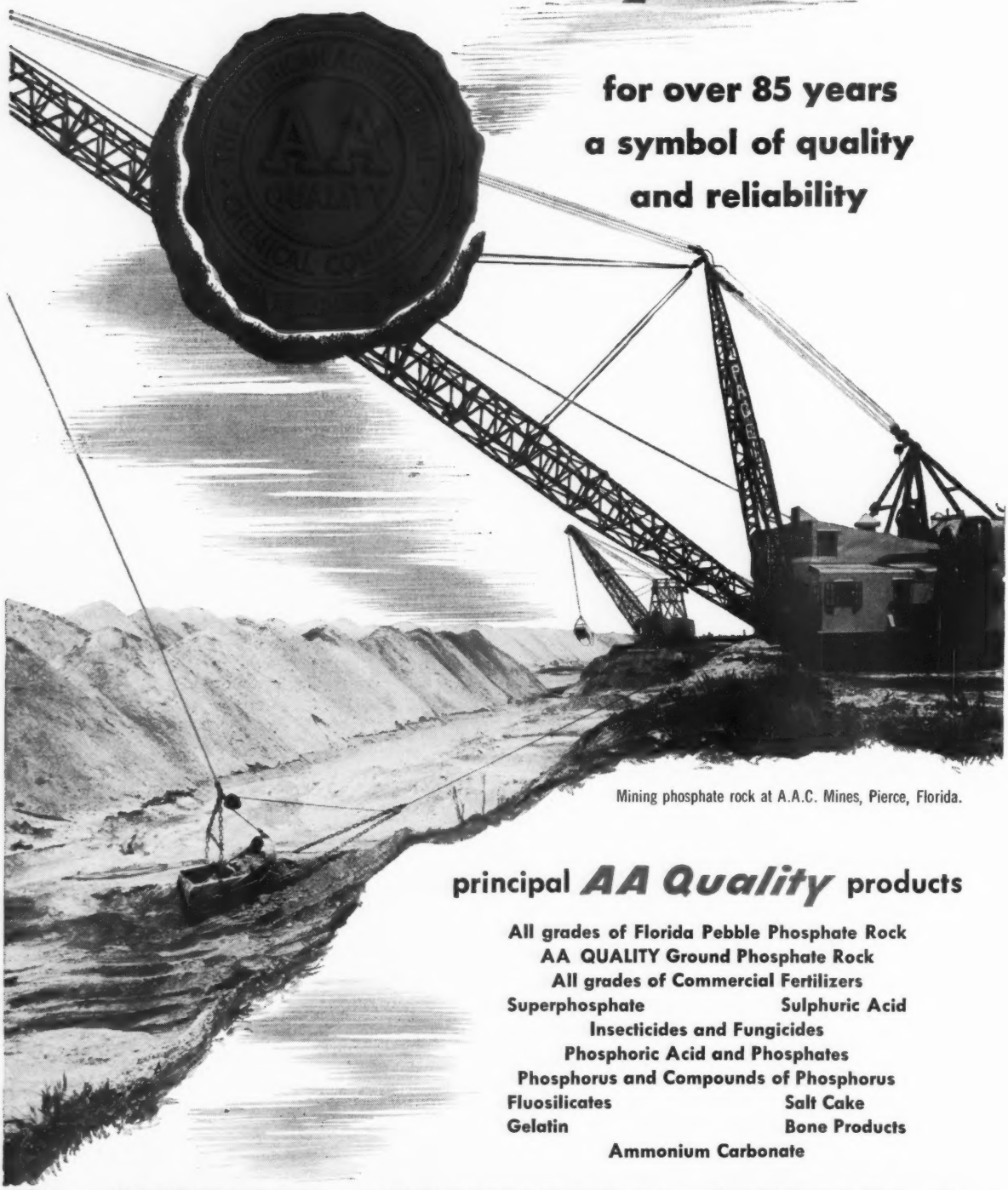
On the latter question, association members will be interested in hearing progress of the cooperative research program of the NACA, the USDA, the National Sprayer and Dusters Association and the Farm Equipment Institute, inaugurated in 1951, because research has been called the keystone of industry progress.

Important problems face the NACA at its spring meeting—problems that affect not only the industry itself, but our whole economy.

It is imperative that through discussion and study by NACA members, answers be found to them.

—HAMILTON C. CARSON

AA Quality...



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farm chemicals outlook

Report from Washington
by Fred Bailey & Don Lerch

Your farm customers are being sucked down in the ebb-tide of price reaction that is spreading to more and more commodities. While many housewives, basing their opinions on food prices, still claim the farmer is riding high, the fact is his net position shows serious weakness.

The farmer is back to where he started before Korea. The latest decline in farm prices, if it holds, will lop a billion more dollars from farm purchasing power. With the exception of four commodities, farm prices are below parity. Not since July, 1950, have farm prices declined to this extent. These USDA findings score another round for those who claim that farm prices are the first to rise and the first to fall.

Congress fears the political implications of falling farm prices. The Senate Agriculture Committee will keep pounding at the question of why food prices remain "sticky" while farm prices fall. The food trade will counter with figures showing that increased labor, transportation and packaging costs often surpass the saving resulting from lower farm prices.

Any way you look at it, the bloom is off the farm market. There is still lots of good business to be had . . . but it will take more digging and more incentive to get the farmer to buy. Salesmen may need more "bait" in the form of better buys.

Weakness in farm commodities is adding fuel to the hot battle over decontrol, expected to occupy a major portion of Washington's energy between now and the time Congress adjourns. Administration opponents, who had only faint hopes a short time ago, now are wearing that "gleam."

Food prices will be a key issue. Next to Joe Stalin, hardly anything activates Congress faster than a barrage of complaints over high food prices. Congress handed the Administration wide control powers on the basis that inflation would be a severe threat to mobilization in 1952. Yet, with the second quarter well under way, attention is being centered on deflation.

Supporters of decontrol will seek to prove that inflation has spent its course, providing the war doesn't get hotter. They will insist on a program of decontrol with specific stop and go signs. For agriculture, this probably would mean that when farm commodities fall below parity, they automatically would cease to be under price controls. Other items may be tied to some historical basis for computing balance between supply and demand. Direct reference to previous prices is unworkable because of higher taxes, plus increased labor and transportation costs.

Farmers will watch this battle with intense interest. There are many in Washington who claim that the constant threat of manipulation by the controllers is causing farmers to stand pat on production plans. While this is not considered the only production deterrent, it probably is an important one.

Industry pricing formulas will also be brought up for inspection during the decontrol fight. There will be determined support for relief to industry, but food will catch the headlines.

Washington is readying its election year-brand of hearty greetings and smiles of confidence. Top policy officials are accepting invitations to take their programs to the grass roots. Politicians are eagerly snatching at opportunities to

appear on radio and TV programs, already closed to them for campaigning unless the time is purchased. Bu the growing array of discussion programs with "balanced viewpoins"t are prime targets.

For those officials with only one foot in the political arena, the campaigns are just another problem to contend with. USDA is ready to launch another major battle with DPA and NPA over the phosphate program. No early solution is in sight, however.

USDA will insist that the sulfur bottleneck be broken through adoption of a program recognizing substantial production in the future must come from processes other than those based on sulfuric acid. It's not a problem that can be solved in a fortnight.

There's a tendency to forget that superphosphate plant capacity now in existence or under construction will more than equal USDA's requirements in 1955, according to reliable estimates. Total production from normal and concentrated plants could exceed the 3,350,000-ton 1955 P_2O_5 requirement by nearly 400,000 tons.

Industry has the capacity both for present and future needs . . . but it is contingent on sulfur. The shortage of sulfur caught Washington and many industries by surprise. Heavy exports of sulfur to speed European armament production have aggravated the situation with no prospect for an early letup. The sulfur shortage is being talked of here in terms of being a permanent bottleneck for many industries.

USDA is not anxious to see new superphosphate plants constructed which depend on regular sources of sulfuric acid. Exceptions are those which might use Western rock and by-product acid.

The Department is putting pressure behind what it feels is an immediate need to build plants producing nitraphosphate or phosphates from other chemicals and heat. Who, what and when are questions likely to be tossed back and forth between the agencies for months.

Quandary points up the problem of government controls over all industry through allocation of materials, loans or both. To make these decisions, officials need unusual skill and ability in finance, industrial operations and market analysis. Combinations of this kind are rare indeed, no matter where you look. When private management makes mistakes, the board starts looking for new men.

Nitrogen expansion faces the same series of hurdles. Among the criteria for government authorization are previous experience in the chemical business, construction plans for areas where the USDA says needs are likely to be highest, preference to those figuring to produce urea and other solid forms of nitrogen, date of filing, etc. Applications are reported far in excess of USDA's goal.

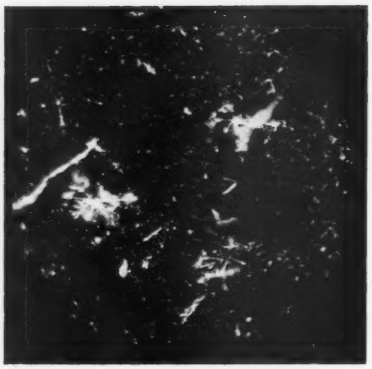
Pesticide industry is anxiously waiting to study findings of the Delaney investigating committee. A quick review of the testimony shows many conflicts in the findings of scientists, industry leaders and government officials. Question is how much support for stricter legislation the proponents can secure among their colleagues in the House. As yet, there appears to be no concerted drive for consideration of the Food and Drug Bill.

There is a big head of steam behind the move to bring the residue tolerance hearings to a conclusion with the issuance of legal maximums as guidance to growers, colleges, the pesticide industry and the food trade. Some colleges are shying away from specific recommendations on certain chemicals until Food and Drug establishes final tolerances.

Growing call for pesticides in pasture programs is expected as USDA increases emphasis on this phase of farm production. Officials see improved pastures as a main source of livestock feed. This heralds new markets for insecticides to control pasture grass pests and herbicides to clear pastures and keep weeds under control.

Mist-o-cide automatically disperses insecticidal fog. To operate the unit

Just Pull the Tab



DDT crystals deposited by Mist-o-cide generator, magnified 150 times. Crystals project upward and outward giving longer contact with insects.

PLACE the small cardboard container in the center of the room. Hold it with one hand and with the other pull the starting tab straight up and out.

Wisps of insecticidal fog appear immediately and billow up through the vent hole in the package, rising quickly to the ceiling.

Leave the area for four hours.

When you return, there won't be any flies, mosquitoes, gnats, midges, moths or any of many other insect pests in the area.

Why? Because the fog will have killed them. In addition, the residue from the fog will control the area against pests for 30 days.

That's how the self-dispersing Mist-o-cide container works. Manufactured by Multiphase, Inc., the Mist-o-cide unit, which has widespread application in the pesticide field, has had an interesting development.

The automatic dispersing unit is an excellent example of novel formulation of pesticidal materials into a product that is easy to use and highly effective. Consequently,

Operator of Mist-o-cide generator places container on floor in center of area being treated. He pulls the starting tab straight up and out and in a few seconds the insecticidal fog starts rising.

its marketing has been very successful. Thousands of the generators were sold in 1951, despite very small distribution facilities, Multiphase reports. The Mist-o-cide division of the company is planning large production for this year.

The new generator for dispersing insecticides in finely-divided form for both space-killing and residual control is the result of more than six years of research by two San Francisco chemists, L. W. Fancher and K. C. Peer.

Idea for the unit originated in the discovery of a unique chemical reaction of dry powders which produce large volumes of steam, gases and a moderate amount of heat.

The inventors, after noting this phenomenon, adapted the idea to the pesticide field. They found that when insecticidal compounds, such as DDT, Methoxychlor, Chlordane, DDD, Lindane, Lethane and others were incorporated into this powdered mixture and the reaction started, the insecticides could be dispersed into the air in a finely-divided, insecticidally-active form.

Many advantages of the self-propelled insecticide were found by Fancher and Peer in thousands of tests with many insecticidal materials.

After starting tab is pulled, insecticidal fog, like that pictured in photograph, rises from carton. In approximately one minute fog reaches ceiling and billows downward, as in cover photograph.

Better Penetration

First it was found that this method, which eliminates carrying solvents and liquid propellants, gives better penetration of the sprayed area. Further, more thorough coverage of insecticide over all surfaces was attained through the generator.

Because of a lack of solvents, the residual deposits do not soak into wood or fabric surfaces. This leaves the insecticide particles entirely available for continued insect control.

Another advantage of the absence of solvents is that finishes and fabrics are not stained by the insecticidal material, or inert matter.

Development of the cardboard container to house the insecticide was a big step in the production of Mist-o-cide, according to the research workers.

They evolved the present generator which has a cylindrical cardboard housing and a self-starting tab which is pulled out to start disperson. No pressure exists in the generator until it is started, according to Fancher and Peer. It is generated only as it is needed during dispersion.

Ordinary cardboard easily withstands the heat generated, which is low compared to pyrotechnic or burning mixtures.

In operation, the generator is set on the floor or on a table top near the center of the space being treated. The tab then is pulled out and the operator leaves the room. The fog generates slowly at firs and reaches maximum velocity as pressure builds up evenly in a few minutes. The operator has plenty of time to leave the area if toxic materials are being dispersed.

Clouds of insecticidal fog quickly are dispersed throughout the space by direct propulsion and thermal convection, because the dispersion is both steam-gas propulsion and thermal.

In an area with a low ceiling, the research men state, the fog will strike the ceiling and billow downward and laterally with considerable velocity. A two-ounce generator will distribute its charge of insecticide evenly in a space of from 6,000 to 12,000 cubic feet in a few minutes.

The company now is making generators in two-ounce, eight-ounce and one pound sizes, to use in spaces of from 3,000 to 96,000 cubic feet. DDT and chlordane in combination are used as the insecticidal agents in the generators now on sale.

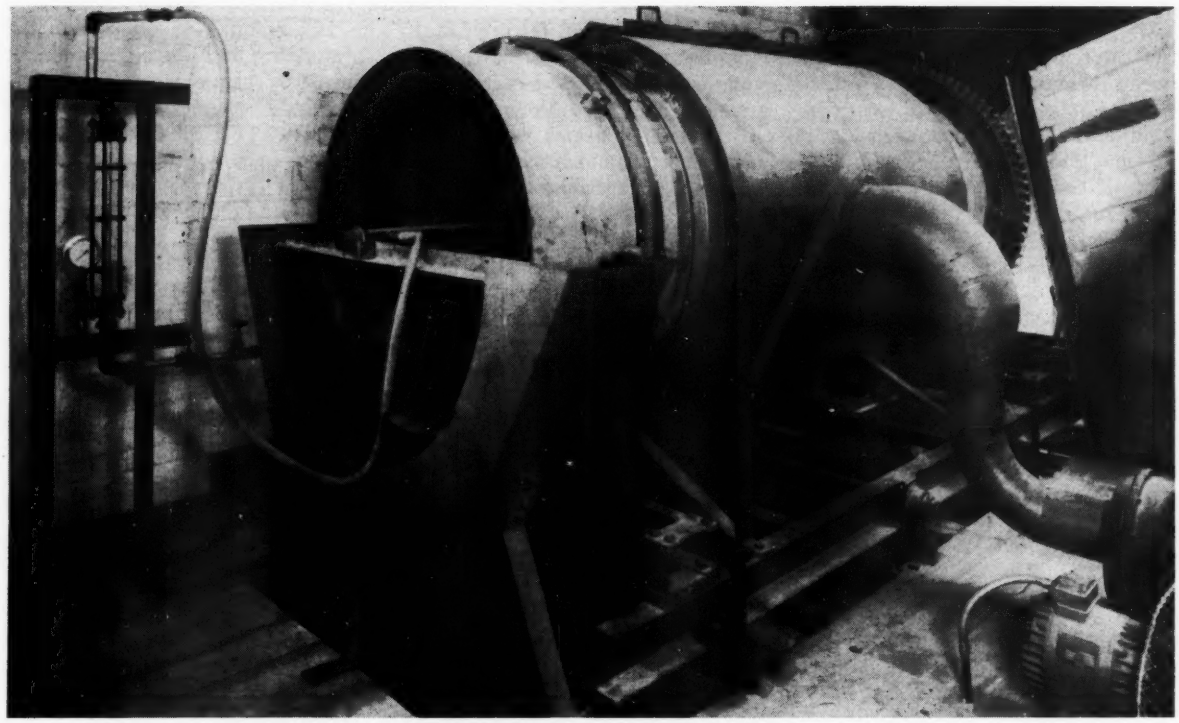
New Formulations

New formulations planned by the company will use lindane, which has an all-round insecticidal application.

The generators contain high percentages of active ingredients, compared with the usual spray or liquid aerosol formulations. The DDT-Chlordane generator, for example, contains 25 per cent by weight of the active ingredient and 75 per cent propellent composition, with no auxiliary solvents present.

Almost any chemical compound which can be steam-distilled without decomposition can be dispersed in the new generator, according to

(Continued on page 47)



Closeup view of granulator used in the Moritz-Sturtevant fertilizer process, now in widespread use in many European countries. The material goes first to a mixer, then is sent to the granulator for pulverizing.

Better for producer and farmer.
These are double advantages of

Granulated Fertilizer

By Dr. M. Stemart

Department manager, Entreprise R. & J. Moritz, 3 Avenue de Pomereu Chatou (Seine-et-Oise).

GRANULATION of fertilizers now is a common practice in most European countries where agriculture has developed to a great extent. Farmers require granulated fertilizers which are easy to spread and prevent clogging of stocked fertilizer.

The producer of compound fertilizers also is interested in granulating fertilizers because bagging and packing is easier.

Most plants on the European Continent work according to the Moritz-Sturtevant process. A Norway plant which treats superphosphate thus was able to stock granulated superphosphate for six months then bag it at a rate of 40 tons an hour, which is quite impossible with powdery superphosphate.

Common Practice

Granulation of single and compound fertilizers has become a common practice in England and France and is beginning to spread to other European countries. Twenty Sturtevant plants are working in England and approximately 20 according to the Moritz-Sturtevant process on the continent and in North Africa.

Compound fertilizer producers with medium or small outputs are able to produce compound fertilizers as granules which allows them to compete with big concerns.

The scheme for fabrication of granulated compound fertilizer, according to the Moritz-Sturtevant process, is well-known.

Simple fertilizers like nitrate of ammonia, potassium chloride, sulfate of ammonia, bicalcic phosphate and calcium superphosphate are placed in distributing hoppers

which deliver the right proportion of the several single fertilizers and send them into a continuous mixer.

The mixed product falls into a granulator, built in such a way as to give round soft balls at the outlet. Necessary water is added in the granulator to allow the granules to take shape as the shell rotates. The granules then are dried, cooled and screened.

Commercial granules are sent to the bagging device, fines are sent back to the granulator and coarse grains are re-crushed. The plant, which is important as regards the mechanical parts, is comprised of auxiliary equipment such as elevators, conveyors, cyclones, ventilators and a heating system.

Use Sulfate of Ammonia

Sturtevant installations, built in England to granulate compound fertilizers, use sulfate of ammonia as simple fertilizer to bring nitrogen to the compound. In England nitrate of ammonia is not used for fabrication of compound fertilizers.

England looks upon nitrate of ammonia as a low grade fertilizer, which brings many worries.

On the continent nitrate of ammonia is the nitrous fertilizer most important for the fabrication of compound fertilizers. France works under similar conditions to those in the United States, where more nitrate of ammonia is used than other nitrous fertilizers.

Serious Defects

Sulfate of ammonia is a simple fertilizer excellent for fabrication of compound fertilizers, while nitrate of ammonia presents serious defects because of its great deliquescence.

But the French farmer is opposed to sulfate of ammonia because its price is higher for one nitrogen unit. A nitrogen unit in sulfate of ammonia is worth 130 francs in France and 96 francs per kilogram in nitrate of ammonia.

Granulation of compound fertilizers from the Moritz-Sturtevant process using sulfate of ammonia as a simple fertilizer to carry nitrogen is totally different from granulation using nitrate of ammonia.

Granulation Is Easy

With sulfate of ammonia as a nitrogen fertilizer, granulation is fairly easy.

The granules take shape in the granulator and readily remain at the same shape when they cross the dryer where they get harder. Operation of the installation is simple, because the operator has only to supervise formation of granules at the output of the granulator.

He moves the water levers which send a mist inside the granulator. If he releases too much water, the granules are too big; if he does not allow enough, there is no granulation and only the dust passes through the apparatus.

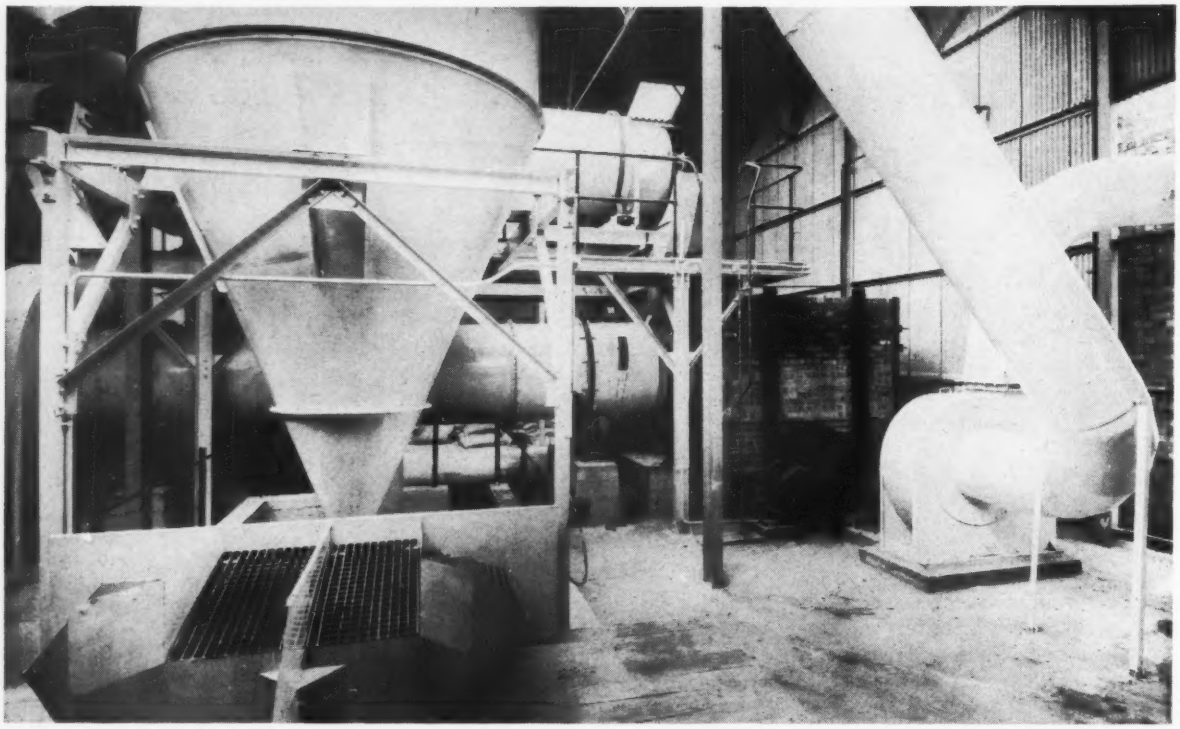
It is quite different with nitrate of ammonia.

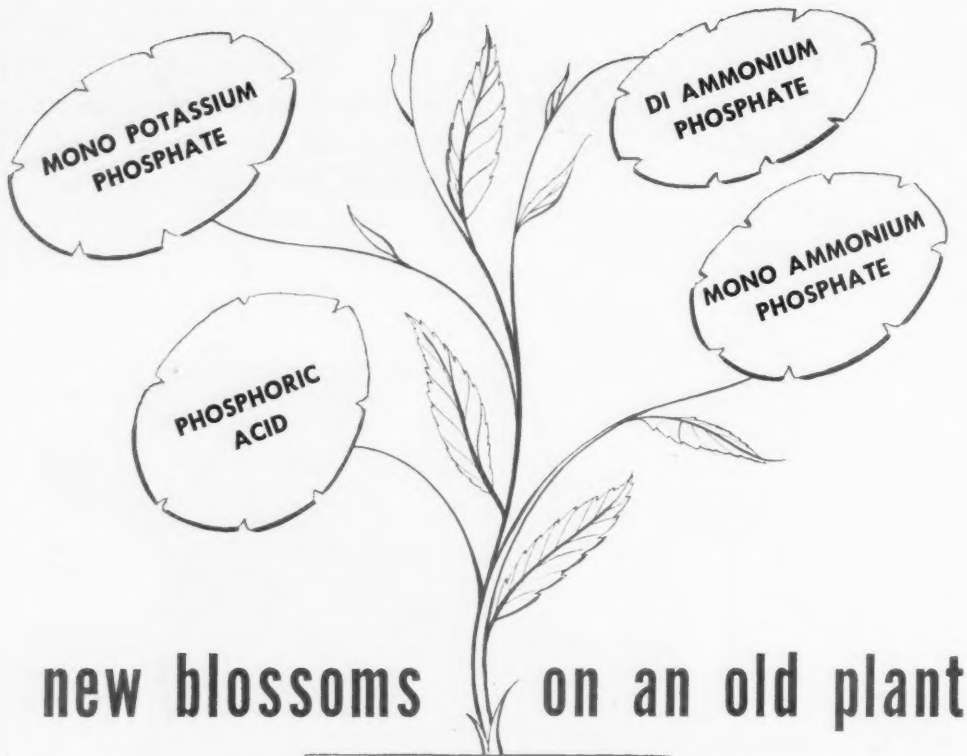
Smelting in Dryer

Normally granules cannot be finished in the granulator. Granulation is not properly accomplished by adding water but by smelting inside the dryer. The free acid in calcium superphosphate plays an important part in this.

Granulation is impossible if calcium superphosphate has too high a grade in free acid. Then neutralizing products such as calcium carbonate and basic slag must be used. The part played by the fines

Another view of the granulation hopper which is part of the granulation process. The granulator yields soft round balls at the outlet. Water is added in the granulator to aid granules in shaping as shell rotates.





new blossoms on an old plant

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This is good news in agriculture and in industry. Increased availability of vital plant nutrients in the form of soluble inorganic salts for fertilizer solutions can mean new products and new markets for fertilizer manufacturers.

New emphasis is being placed upon WATER-SOLUBLE FERTILIZERS. Growers and manufacturers are developing new methods . . . new applications of high-analysis soluble plant foods which combine NITROGEN . . . PHOSPHORUS, POTASH and, in many cases, weed killers and insecticides, too.

MONSANTO, to help meet the increasing demands for plant foods, has increased quantities of four basic, soluble fertilizer chemicals . . . MONO AMMONIUM PHOSPHATE . . . DI AMMONIUM PHOSPHATE . . . MONO POTASSIUM PHOSPHATE . . . PHOSPHORIC ACID 75.0%.

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MONSANTO PLANT NUTRIENT CHEMICALS

	N	P_2O_5	K_2O
Mono Potassium Phosphate (Crystals)	—0—	51.6%	34.2%
Di Ammonium Phosphate (Crystals)	21.0%	53.85%	—0—
Mono Ammonium Phosphate (Crystals)	12.2%	61.61%	—0—
Phosphoric Acid (75.0%) (Liquid)	—0—	54.5%	—0—

circling in the plant must not be overlooked. The drying temperature must be surveyed with care and must not get above a maximum which is a function of several factors.

Different Process

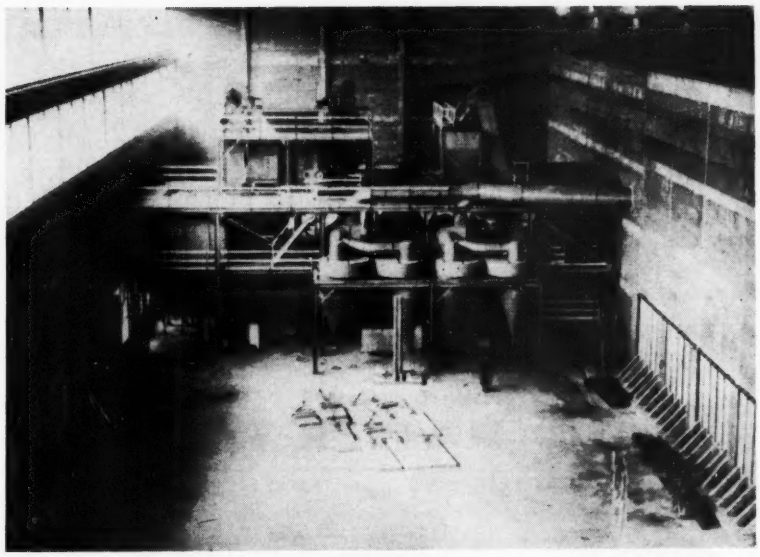
All these facts combined make the effective working of the fabrication of granulated compound fertilizers, which contain nitrate of ammonia, clearly different from the old processes using sulfate of ammonia, and, in France, a restudy of every factor which works on the internal reactions of the granules during its formation, had to be made.

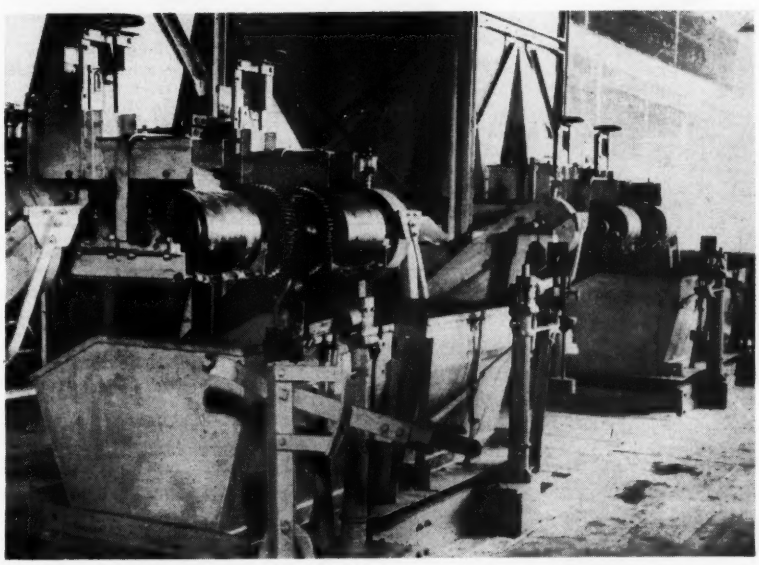
One reaction allowed by the Moritz-Sturtevant process is the double decomposition between potassium chloride and nitrate of ammonia, which gives first grade nitrate of potassium as a final product. This plays an interesting part in the feeding of the crop.

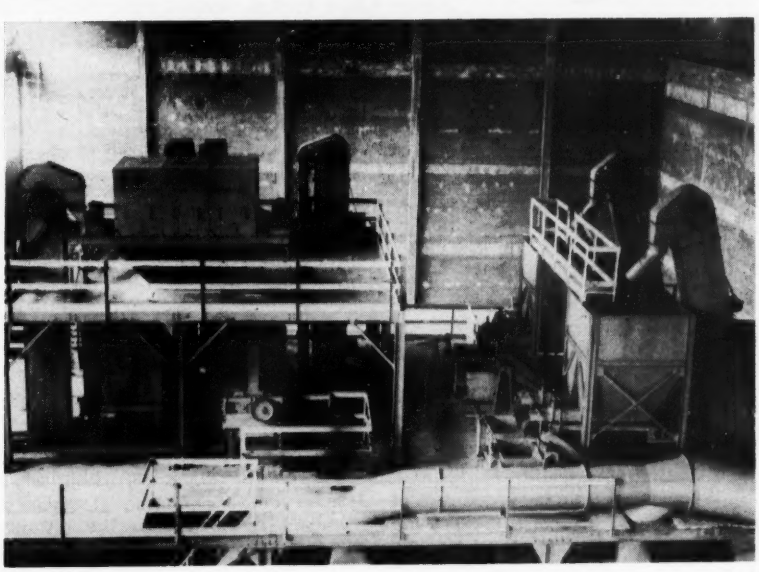
Because of this fact, sale price of granulated compound fertilizers which contain nitrate of potassium are higher than those of fertilizers containing only potassium chloride and nitrate of ammonia.

Double Decomposition

The double decomposition is comparatively easy, and for the Moritz-Sturtevant installations, it takes place while granules travel through the unit constituting the granulation plant. This granulation process for producing compound fertilizers with nitrate of ammonia as a basis consumes less water then when the fertilizer has







Top: General view of the Moritz-Sturtevant process for granulation of fertilizers, which now is a common practice among European compound fertilizer manufacturers.

Middle: Measuring device for determining quantity of granulated fertilizer produced in the unit. Nitrate of ammonia generally is used in France for this type production.

Bottom: Measuring unit and screening stand of the French granulation system. Commercial granules next go to the bagging device, fines are sent back to granulator.

Virginia strawberry grower

Maine potato grower

California vegetable grower

Arizona vegetable grower

Oklahoma wheat grower

Minnesota corn grower

NO MATTER WHAT YOU GROW....

Tennessee tobacco grower

California citrus grower

Georgia pecan grower

New Jersey bean grower

New York vegetable grower

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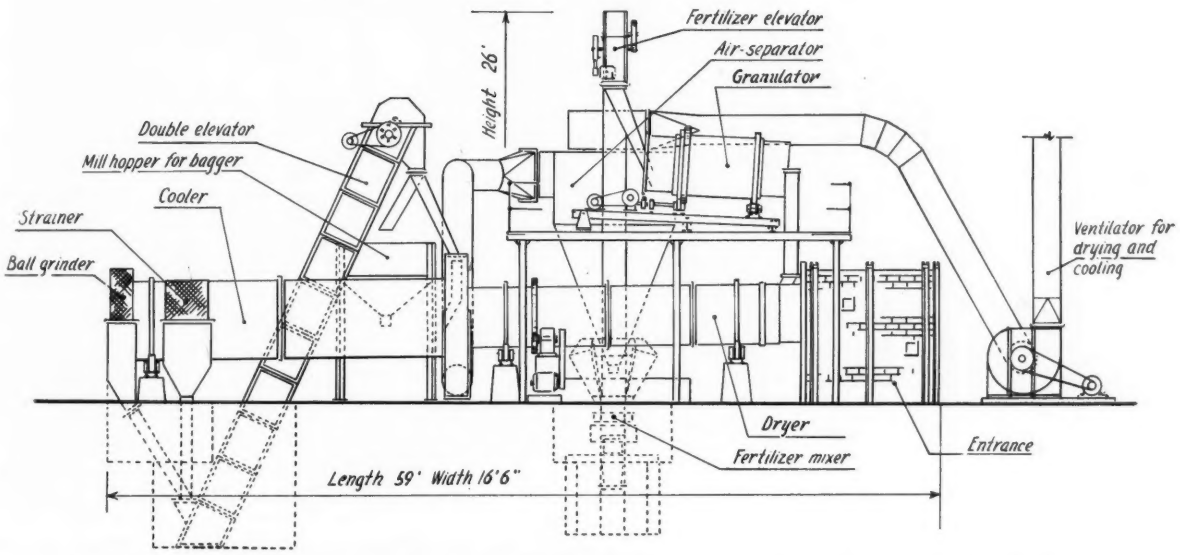
Moritz-Sturtevant Plant Design



Design of the Moritz-Sturtevant plant for manufacturing granulated fertilizers. Simple fertilizers are placed in distributing hoppers which deliver the right proportion to a continuous mixer. Mixed product goes to the granulator. Water is added to give shape to granules. Granules then are cooled, dried and screened.

sulfate of ammonia as a basis. Consequently the consumption of fuel required for drying and hardening the grains is reduced to 15 or less kilowatts of coal per ton.

The consumption in kilowatts per hour varies from seven to eight kilowatts per ton of granulated compound fertilizer. The labor necessary to work the installation is reduced because it is automatic and strictly continuous.

French producers of granulated compound fertilizers endeavor to solubilize raw phosphate immediately before granulation. Similar experiments have been conducted in England (Proctor-Ogilvie process) and have given very interesting results.

Direct Production

Producers of average importance can produce their own superphosphate directly, without using a den, and send the liquid superphosphate directly into the granulator. However, when nitrate of ammonia is used as a fertilizer to bring up nitrogen, the process cannot be maintained in its entirety and Entreprise R. & J. Moritz installs the Moritz-Standaert den for continuous production of superphosphate before the granulation plant.

The calcium superphosphate continously flowing out of the den travels to the mixing device with other simple fertilizers before granulation.

Working Continuously

Both installations, solubilization of phosphate by sulfuric acid and granulation thus are working continuously.

In France the granulated compound fertilizers 10-10-10 are used on a big scale, along with 5-10-10 fertilizers. These two are the main fertilizers used. In some regions, especially agronomically rich, increases in the quantity of fertilizing units to reach 40 to 45 are sought by introducing triple superphosphate or any rich phosphate fertilizer.

Fabrication of granulated compound fertilizers has become general practice in France since World War II. All big concerns producing fertilizers such as St-Gobain, Kuhlmann, P.E.C. and Engrais d'Auby work according to their own methods or the Moritz-Sturtevant method. Producers of middle importance use solely Moritz-Sturtevant plants.

Conclusion

Use of nitrate of ammonia as a simple fertilizer carrying nitrogen necessitated the adaptation of the Sturtevant process, using sulfate of ammonia.

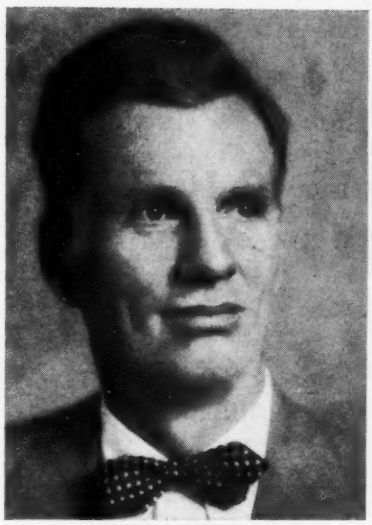
Farmers require the granules to look perfectly round, without any dust of a size which will pass through 2–4 millimeter or 3–5 millimeter mesh.

The producer is allowed to sell the granulated fertilizer 500 francs higher per ton than the same fertilizer when it is not granulated.

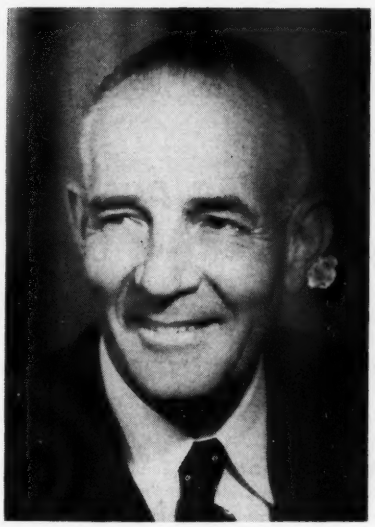
Average cost of a ton of compound fertilizer is 20,000 francs.

But with widespread development of the granulated fertilizer industry, however, many producers do not charge that much.

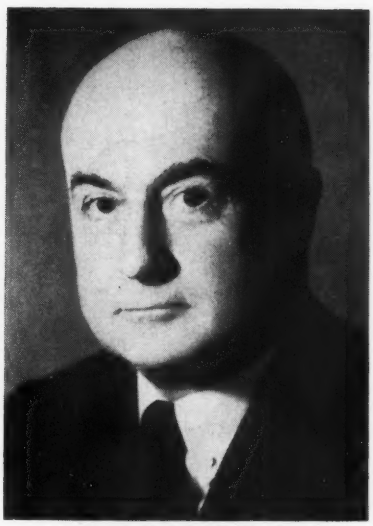
Because of ease of spreading and the fact that the material does not become clogged, the farmer receives great benefits from the use of granulated fertilizer. In addition, it is advantageous to the manufacturer because it is easier to bag and package. ◆



W. R. Allstetter



Arthur W. Mohr



Joseph E. Cary

NACA Meets in California

A REPORT on activities of the National Agricultural Chemicals Association and the pesticide industry in general during the past year was scheduled to keynote the big west coast meeting of the NACA in San Francisco April 6–9.

The report, by Arthur W. Mohr, president of NACA and the California Spray - Chemical corporation, was the opening talk on the meeting schedule.

Other speakers scheduled for the opening session in the Fairmount Hotel, included W. E. Ball, Joseph E. Cary, W. R. Allstetter and Dr. G. F. McLeod.

Reception Sunday

Plans for the meeting, announced by Lee S. Hitchner, executive secretary of the association, called for a reception for members Sunday afternoon and evening.

Advance registration figures indicated a large attendance, despite long travel distances for many members of the association, Hitchner reported.

Following Mohr's address, Cary, executive vice president of the Food, Machinery & Chemicals corporation, was to speak on the pesticide outlook for the year from an administrative viewpoint.

Allstetter, deputy director of the Office of Materials & Facilities, Production Marketing Administration of the United States Department of Agriculture, was to give a talk on the problems facing industry personnel in the marketing of farm chemicals.

Allstetter, who joined USDA in 1936 after graduation from Swarthmore College, recently was appointed vice president of the National Fertilizer Association.

The western outlook for insecticides and other control chemicals was to be discussed by Ball, president of the Western Agricultural Chemicals Association.

Concluding Monday's session was a scheduled talk by Dr. McLeod, technical vice president of Sunland Industries, Inc., Fresno, Calif. No business sessions were scheduled for Monday afternoon.

Presentation of problems by members of the NAC staff and committees along with a business meeting was set to open the second session Tuesday morning.

Entertainment for members and their families was on the agenda for Tuesday afternoon, with a golf tournament highlighting the activities.

The annual banquet, with no after-dinner speakers included, was to climax the day's activities in the evening.

Pesticidal work in foreign countries was the topic to be considered by Dr. A. M. Boyce, head of the division of entomology of the California Citrus Experiment Station.

Other Speakers

Other speakers scheduled for the concluding session were Dr. Stanley B. Freeborn, of the University of California at Berkely and W. C. Jacobsen, assistant director of the California State Department of Agriculture.

Freeborn was to discuss the relationship between pesticides and food production in reference to recent Delaney committee hearings.

Entertainment planned for wives and families of members included bus and steamer tours, a luncheon and a fashion show. ◆

CLARENCE CHASE

Fertilizing pastures with 10-10-10 produced an extra $90 worth of dairy feed per acre for Gale and Clarence Chase,

SUN PRAIRIE, WIS.

THE CHASE BROTHERS of Sun Prairie, Wisconsin were among farmers who cooperated in the pasture improvement program sponsored by the University of Wisconsin under the Direction of C. J. Chapman, Professor of Soils. Here's their report:

"We fertilized part of our pasture last spring with 10-10-10 at about 500 pounds per acre. The growth of grass was so rank we could have cut a hay crop by the middle of June.

"In a demonstration set up on our pasture by the county agricultural agent, yields were taken. The unfertilized area made 2531 pounds of dry material per acre, and the fertilized made 5737 pounds per acre, an increase of 2905 pounds. This extra feed was the equivalent of 16-18% dairy feed which, at $60 a ton, would be worth about $90."

GALE CHASE

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To give your customers the most effective high-nitrogen fertilizers, use U·S·S Ammonium Sulphate for a major part of the nitrogen content. It's a dry, free-running material that stands up well in storage and performs well in distributing equipment. Its all-ammonia nitrogen won't leach, yet becomes readily available during the growing season.

Promotion efforts you put behind high-nitrogen fertilizers containing U·S·S Ammonium Sulphate will yield big returns. You and your dealers can recommend it for pastures, corn, wheat and other small grain. The spring fertilizer season is at its height; get your share of this business. United States Steel Company, 525 William Penn Place, Pittsburgh 30, Pa.

U·S·S AMMONIUM SULPHATE

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UNITED STATES STEEL

Stronger papers, treated with synthetics and sewed with acid-proof thread are forecast for

Multiwall Paper Bags

of the future

By Noyes Baker
International Paper company, Bagpak division

Delivered at meeting of Fertilizer division of American Chemical Society, New York, Sept. 7, 1951.

PRIOR TO THE fall of 1932 and early part of 1933, fertilizer was packed in open mouth textile bags, and in the main these bags were closed after filling either by hand sewing or hand tying. Both open mouth and valve type multiwall paper bags were available at that time, but the valve packers of that day were incapable of handling fertilizers, and the open mouth bags—mainly of the pasted bottom type—had to be closed by tying because there was no bag closing equipment adapted for making a sewn closure on multiwall paper bags.

First Models

At about that time, Bagpak division, in cooperation with Consolidated Packaging Machinery corporation, developed the first early models of equipment for closing filled sewn gusseted open mouth multiwall paper bags with a strong reinforced sewn closure and pioneered the first usage of these bags in the fertilizer industry.

The construction of this bag to hold 100 pounds of mixed fertilizer, consisted of three 40 pound basis weight plies and a 50 pound basis outer ply, a total of 170 pounds basis weight.

After successful experimental shipments of fertilizer in multiwall paper bags proved their efficacy, their use grew rapidly. As time went on improvements were made in the bag construction to take care of special problems which arose.

One was the development of an outer ply resistant to sudden showers and ground moisture, when farmers reported deterioration of bags in the fields or in transit during showers, or when left on the ground overnight.

Acid Resistant

Another important and most necessary improvement was the addition of an acid resistant inner ply or plies to prevent deterioration of the paper by shipment of insufficiently cured fertilizers or those giving naturally a highly acid reaction.

Great advances have been made during the past 20 years in the manufacture of kraft paper, especially in that made from Southern woods. Earlier, Southern kraft was at some disadvantage as compared with Northern kraft, from the overall strength standpoint. This no longer is the case.

Originally the Mullen or "Pop-test" was the only recognized measure of the strength of kraft paper. It now is recognized that this test is entirely inadequate for the purpose, and it has been eliminated from consideration because of advanced paper and bag technology which has determined that a proper combination of tests, especially tensile, tear and stretch, in both directions, together with *p*H, are the important ones in determining the quality of multiwall bag kraft papers.

New and up-to-date specifications for paper, for paper shipping sacks, recently have been approved for government use. These specifications are published in Federal Specification UU-S-48b. Paper in multiwall bags sold by all recognized members of the industry will meet these specifications.

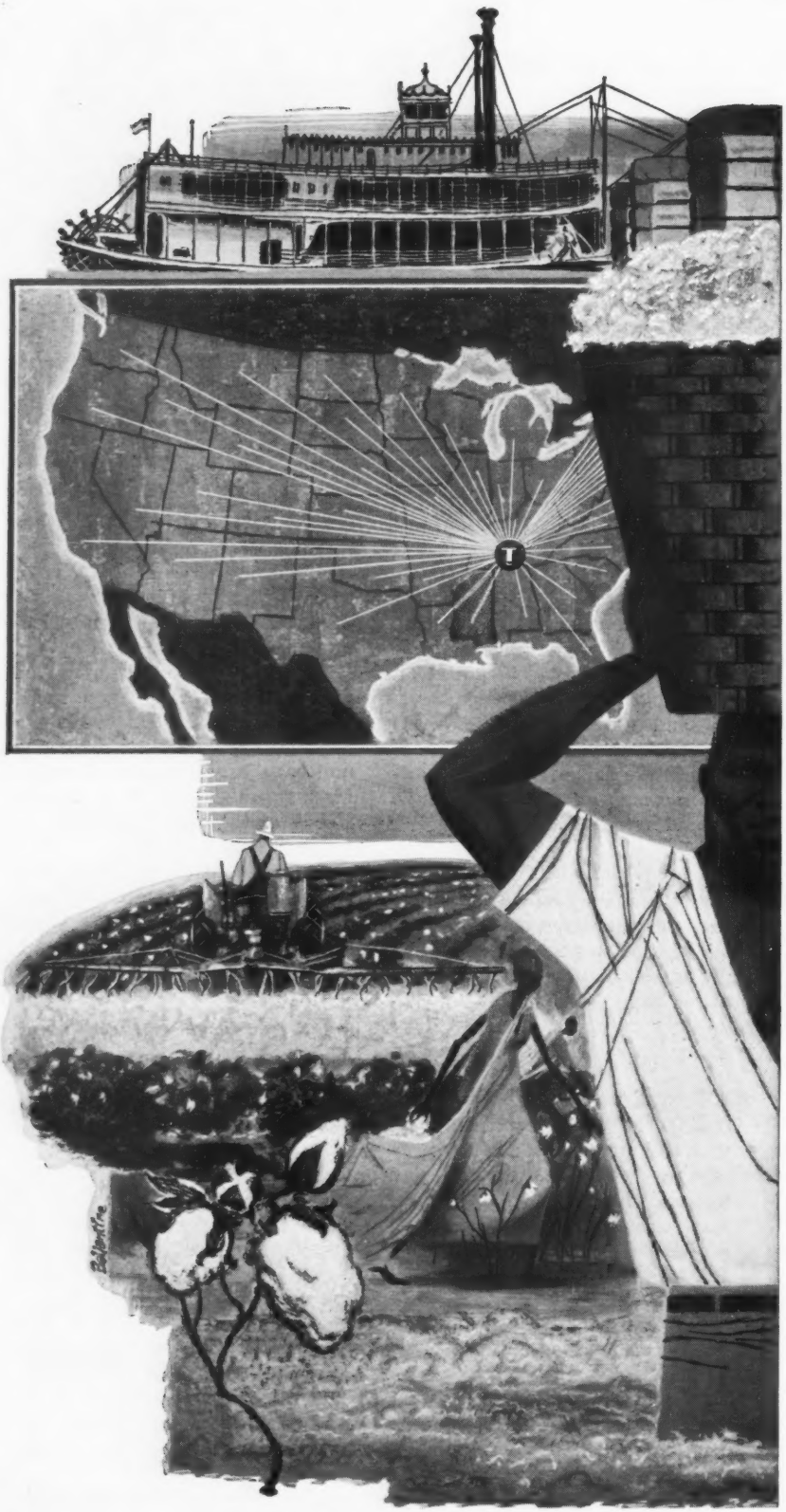
Despite the fact that kraft paper machine speeds have risen from approximately 800 feet a minute to 1500 feet a minute or more—virtually doubled—in the past 20 years, and notwithstanding the fact that during the last war the basis weight standards were reduced 4 per cent to conserve paper, overall quality of multiwall bag kraft paper has still been improved.

Determining Size

One is occasionally asked "How do you determine the proper size of bag for a given capacity of a specific commodity?" There is no definite equation or formula which will answer this question, because the cross sectional area of filled bags when piled face to face varies, not only in size and type of closure, but also in whether they are valve type or open mouth. It is therefore a problem which must be answered empirically.

First, we must know the density

THERE'S A TOUCH OF TENNESSEE IN MISSISSIPPI COTTON



Old times in Mississippi and throughout Southern cotton fields are not forgotten... times when the boll weevil claimed great portions of the cotton crops. Today dust and spray formulations protect the cotton from boll weevils and other destructive pests. The active chemical in these formulations is Benzene Hexachloride (BHC) which Tennessee Products produces in large quantities.

Protecting cotton is not all that Tennessee does in Mississippi. For instance, Tennessee ships Tensulate Insulation and Tensulate Perlite, a light weight aggregate, for the building industry. And you will find products from Tennessee in every state in the country doing a wide variety of jobs. That's why Tennessee is known from Coast to Coast as the industry that serves all industry.

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of the material, together with the bag capacity desired; next, whether it settles readily, or whether it has a tendency to retain entrained air, and lastly, whether it is to be packed in valve bags or in open mouth bags, and if the latter, how they will be closed after filling. For any given capacity, the bag may have an infinite variation in shape.

From the standpoint only of strength, a square bag is best, but such a shape is impractical for many reasons. Where it is desired to cross pile in pairs, the filled bag width obviously should be one-half its length.

It is generally conceded that the thickness of a filled bag as it is piled on its face, should be approximately one third of its filled width. The shape of a sewn open mouth bag may, in some cases, be dictated by the circumference of the filling spout, or by its height above the floor or conveyor.

Bad Shape

One shape which definitely should be avoided is that which gives a long, narrow, thin package. When such a bag is picked up by its ends in the normal manner, it sags in the middle to such a degree that the walls on the under side are put under excessive tension and are likely to split transversely.

Despite the fact that flat tube sewn bags have a slightly greater capacity than the gusseted sewn type of the same tube size, their use is not generally recommended by the industry. They tend to give a non-uniformly shaped filled package because of the protruding ears at one end in the case of sewn open mouth bags. When they are used as valve bags, the projecting ears tend to inhibit close piling and the valves tend to sift more than those in the gusseted type.

Another common question is "How do you determine the construction of a bag for any specific purpose?" The overall construction depends upon a number of factors: the weight to be carried; the physical characteristics of the material, especially its flow characteristics; its value and shipping conditions, whether domestic carload, less carload, truck or ocean shipment. These are the main strength determining factors.

Need for incorporation of special sheets in the bag is determined from the following information about the product: hygroscopicity, acidity, alkalinity, oil or grease, abrasiveness or any unusual characteristics.

From the preceding statement it will be gathered quite readily that development of the proper construction for a multiwall paper bag is a matter of practical experience. There is an old rule-of-thumb maxim in the industry, which states that for 100 pounds of a relatively inexpensive material, the bag should have a total basis weight of paper equal to two pounds for each pound of material packed, but this needs to be modified upward if the bag is much above the average in size, if the material packed is very free flowing or is of such value that even a minimum of breakage cannot be tolerated. For example, bags for expensive plastics usually will run an appreciably higher ratio of total basis weight to capacity. A bag of 75 to 80 pounds capacity usually can be cut down very little in basis weight from the requirements for 100 pounds capacity. As the capacity of the bag is reduced, the number of pounds of total basis weight of paper per pound of material should, in general, be increased.

Some important facts about the development of multiwall paper fertilizer bags are given in the article. The author, Noyes Baker, describes early uses, methods of testing for strength and construction of the bags. He also makes some interesting predictions about the future of multiwalls, which he believes will be greatly improved by chemical research in synthetic materials.

Proper 'Nesting'

Because the theory of multiwall bag strength is that each individual ply should take its share of the load, various plies should be properly "nested;" that is, there should be no difference between the circumferences of the various plies except that caused by thicknesses. Proper nesting is best realized by having the least possible variation between the basis weights of adjacent plies. Bag constructions are specified from the inside ply outward, and heavier basis weight plies usually are placed outside, with lighter plies inside.

For certain commodities, or to take care of special requirements, special sheets are embodied in the bag construction.

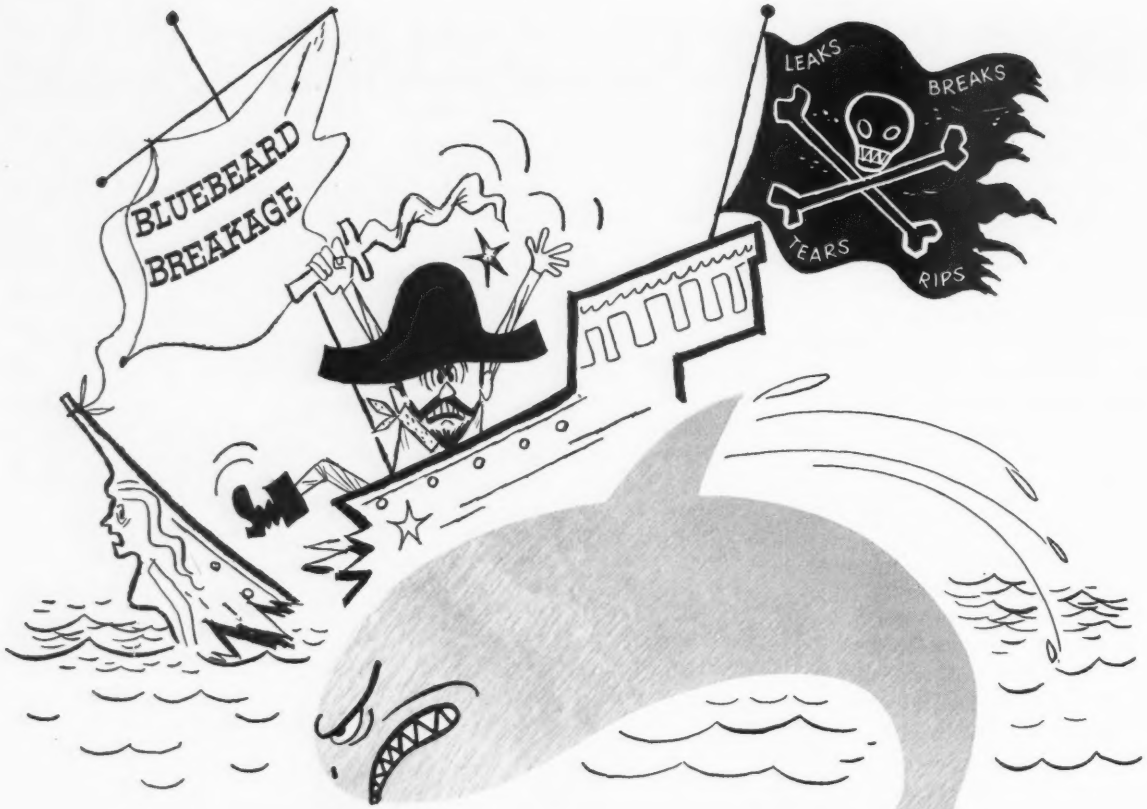
Consider those which are of importance to the fertilizer industry. One of the earliest matters which came to light was the need of an outer ply which would be resistant to sudden showers and to ground dampness. This resulted in the development of such a sheet, variously named by different members of our industry, which is supplied today as the outer ply of almost all multiwall fertilizer bags, at no extra cost above thatof plain kraft.

Synthetic Resins

Several of the newly developed synthetic resins or plastics have superlative resistance to acids, alkalies and to water vapor, when applied as a coating to kraft paper. They still are very expensive compared with asphalt laminated kraft. For this reason they are limited in use to the packaging of expensive materials. Cost of a 50 pound kraft sheet coated with 20 pounds basis weight of polyethylene—the plastic coating best known in the industry today—was 3.2 times that of a 90 pound asphalt laminated sheet on a square yardage basis at the time this paper was prepared. Plastics in general at present are on government allocation.

Strength of a 90 pound asphalt laminated kraft ply in a bag normally is considered by the industry as being equivalent to that of a 50 pound basis weight natural kraft ply, and wherever possible it is considered preferable from the overall bag strength standpoint to have the asphalt laminated sheet as the inner or next to inner ply.

Strength of a polyethylene coated



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sheet is a moot question. From a laboratory test standpoint, because the polyethylene coating is quite stretchable and does not adhere tightly to its kraft backing, such a coated sheet shows virtually no difference in test from the kraft paper alone. There is some evidence, however, that as a component of the bag construction it adds in strength more than that of the same kraft sheet if it were uncoated. Customary water resistant kraft and waxed kraft neither gain nor lose in strength, because of their treatment.

One thing very much needed for the manufacture of many bags for the industry is a really acid-resistant sewing thread at a cost which is not far out of line with that of cotton thread. The best we have been able to do at a reasonable price—aside from the secondary result of wax dipping previously mentioned—is the use of oiled thread. It helps, but it isn't acid-proof.

Fibreglass Thread

The latest fiberglass thread, as well as thread made of Du Pont's newest synthetic fibres, Orlon and Dacron, are what the doctor ordered, but for the present at least, they are far too expensive. At present day prices, for example, the actual cost of 5/12 cotton thread only for closing both ends of 17 inch face width fertilizer bags is approximately $3.30 per M bags, whereas the similar costs for Orlon and Dacron threads would be approximately $12.10 per M and $8 per M respectively. Fiberglass thread used earlier would not stand the 180° bending required in the bag sewing operation. There now is available a fiberglass thread of special twist which can be used on our sewing machines, but to date it is made only in a relatively small diameter which has a tendency to cut the paper at the needle holes when subjected to more than usual strain—such as an edge drop of the filled bag.

Cost of this thread for closing both ends of a 17 inch face width fertilizer bag is approximately $7.20 per M bags.

As previously mentioned, when paper bags first were used in the fertilizer industry, they were exclusively of the open mouth type and were either wire tied or sewn closed, usually the latter. Valve bag packers and valve type bags long had been used, mainly in the rock products industry, but the available impeller type valve packer of that day was not found suitable for packing fertilizer.

Since then valve bag packers of other types have been developed which pack fertilizers in valve bags satisfactorily. Accuracy of weights is dependent upon type of scales used—whether automatic or otherwise—as well as upon the human element, particularly when automatic scales are not used, and also upon the flow characteristics of the material packed.

Now I will produce my crystal ball and tell all about the multiwall paper fertilizer bags of the future. I hope I shall not be held too accountable for my predictions, but here they are:

1. Overall strength of kraft paper for multiwall bags someday soon will be increased by additives in the course of manufacture. This is possible now, but still prohibitive in cost.

2. As chemical research continues, and production facilities for synthetics increase, there will be greater expansion in the use of paper coated with such synthetic products, and at a cost which will not be as prohibitive as is now the case.

No Deterioration

This will give bag manufacturers materials proof against deterioration from attack of almost any type. Some commodities which conceivably could be protected by a special inner ply would still present a shipping hazard in paper bags.

3. Acid and alkali-proof threads at prices which are not excessive, are not far off.

4. There will be heat sealed bags which can be made completely moisture-proof, oil and grease-proof air-tight and gas tight. At least one member of our industry already has produced some heat sealed multiwalls, but new forms of bag making and closing equipment will have to be developed before such bags become commonplace. ◆

Pennsalt Wins AIM Certificate For Management

One of the 10 best managed corporations of more than 3,000 studied by the American Institute of Management is the Pennsylvania Salt Manufacturing company, the AIM announced this month.

In transmitting its Certificate of Management Excellence, the AIM reported that their analysis to determine this rating covered 10 categories. These are: economic function, corporate structure, health of earnings growth, fairness to stockholders, research and development, directorate analysis, fiscal policies, production efficiency, sales vigor and executive evaluation.

The Institute reported that its studies included 47 chemical corporations, classified as such by the Securities and Exchange Commission, and that 13 of these corporations, including Pennsalt, received certificates. Pennsalt received a similar award last year and at that time was cited by AIM as having the highest score of all companies studied in the category, "fairness to stockholders."

The American Agricultural Chemical Co., Inc., New York and The Consolidated Mining & Smelting Co. of Canada, Ltd., Montreal, were awarded Certificates of Management Excellence for 1951 by the AIM. According to Jackson Martindell, president of that nonprofit foundation, only 298 firms in the United States and Canada were deemed eligible to receive the designation.

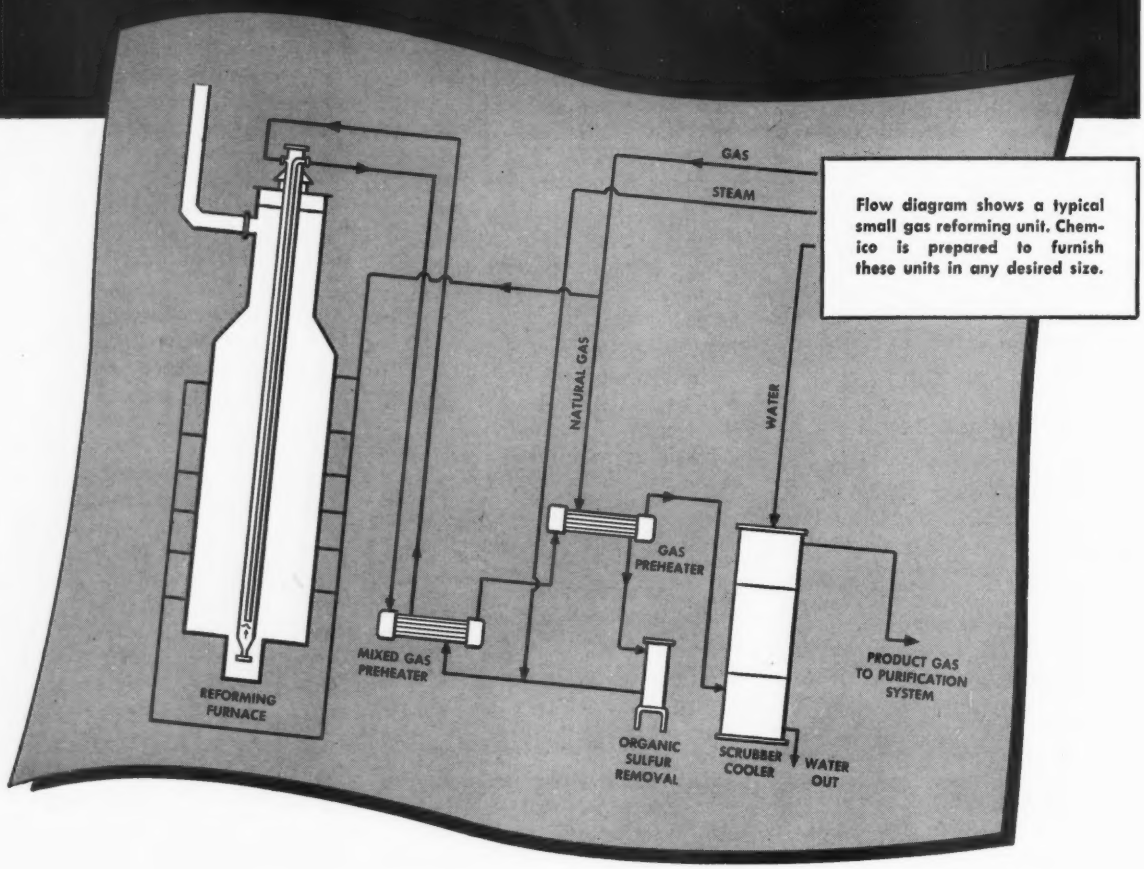
This is the first time American Agricultural has received the A. I. M. Award. Consolidated Mining & Smelting was on the list of "excellently managed" firms a year ago.

"It is heartening to note," the Institute official declared, "that 70 more firms are receiving awards this year than did a year ago. This proves that companies are tightening up on their methods and procedures and improving their relations with employees, stockholders and the public."

Produce Hydrogen

OR HYDROGEN MIXTURES

at Low Cost with a Chemico Plant



Flow diagram shows a typical small gas reforming unit. Chemico is prepared to furnish these units in any desired size.

Chemico offers units for the production of hydrogen mixtures by the catalytic reforming of hydrocarbon gases such as natural gas, propane and butane. For synthesis work, product gas can be limited to trace amounts of impurities. Other Chemico units may be used to produce controlled ratio mixtures of hydrogen with carbon monoxide, carbon dioxide or nitrogen.

Chemico has built these reforming plants in various sizes, ranging in capacity from 150,000 cfd. to 24,000,000 cfd. These plants are simple to operate, have virtually automatic centralized control, and are highly efficient.

If your plans call for producing hydrogen or a hydrogen mixture for any industrial use, write us about your specific application.

CC 231

CHEMICAL CONSTRUCTION CORPORATION

A UNIT OF AMERICAN CYANAMID COMPANY

488 MADISON AVENUE, NEW YORK 22, N. Y.

CABLES: CHEMICONST, NEW YORK

TECHNICAL REPRESENTATIVE IN EUROPE—CYANAMID PRODUCTS LTD., LONDON

TECHNICAL REPRESENTATIVE IN SOUTHERN AFRICA—SOUTH AFRICA CYANAMID (PTY) LTD., JOHANNESBURG

Chemico plants are profitable investments

Iscothan

has been recommended for control of powdery mildew after many tests

By Richard H. Barton
Innis, Speiden & Company, Inc.

AFTER extensive preliminary tests with a yellow wettable powder, Innis, Speiden & Company, Inc., now has recommended the substance for control of powdery mildew on most ornamental flowers.

The fungicide, called Iscothan, has excellent application for control of the fungus on roses, where it is very prevalent and destructive, and has secondary value as a miticide.

Commercial florists are not the only persons who will be interested in company recommendations for its new product, for excellent preliminary tests with the material on red raspberries and shade trees, have been reported.

Better than Sulfur

An important feature of Iscothan is its advantages over sulfur as a combattant of powdery mildew.

Iscothan, 15 per cent active dinitro capryl crotonate, is used either as a spray or a dust to control mildew.

It does not deteriorate quickly while in bulk, has a neutral *p*H filler and is compatible with many other spray mixtures.

As compared with sulfur when, used for the same purposes, Iscothan has several important advantages.

First, it is less phytotoxic. Iscothan, when carefully applied, may be used in quantities sufficient enough to be effective without causing defoliation, discoloration or burning.

Especially in the greenhouse, it may be used early in the fall or late in the spring without the necessity of artificial heat. It is compatible with parathion.

As a spray, dosage recommendations are for six to eight ounces of Iscothan to 100 gallons of water, or four level tablespoons to 12½ gallons of water.

Best results are obtained by using a fine mist spray (No. 2½ nozzle) and from 100 to 300 pounds pressure.

Application should be made when foliage will dry before air temperatures reach 90 degrees or more or at a time when foliage and premises will dry before sudden temperature drops late in the afternoon. Because powdery mildew grows most readily on the under side of new growth, Iscothan spray should be directed upwardfrom a level of about half the height of the plant under treatment. One hundred gallons of spray should cover 3000–4000 rose bushes. Treatment may be repeated in six- to seven-day intervals or as needed.

A wetting agent is recommended for optimum results. One part of detergent to 2000 parts of water or about four to six ounces of spreaders such as Vatsol OTB, Santomerse S or Triton X 100 to 100 gallons of spray is sufficient for most waters. If local water is exceptionally hard, a little more detergent may be added. Addition of excessive amounts may cause burning. Experience in using fish oil soaps and caustic soap powders has not been satisfactory.

Tests indicate control of powdery mildew has been successful on roses, snapdragons, chrysanthemums, delphiniums, bella donna, larkspur, beans and clover. There has been some injury to a few varieties of roses.

Good preliminary reports from trials on red raspberries and shade trees indicate the vast fields open to this material. There are many other plants not sensitive to Iscothan which probably could be treated to control powdery mildew. Suggestion is made, however, that such applications be made on a trial basis until more conclusive data is gathered.

Powdery Mildew

Iscothan has been successfully used as a dust to control powdery mildew on most cucurbits. Investigators have reported good control using three pounds of Iscothan to 97 pounds of a good agricultural filler.

Ordinarily 30 to 50 pounds of dust are used to the acre depending on the size of the plants. Hoods on the dusters often are used to insure better plant coverage.

In general, fungicidal dustings are more effective if a low concentration is used at a high rate of application rather than a high concentration at a low rate. Usual precautions should be observed in handling Iscothan as with most fungicides, and applications should not be made on edible crops later than 14 days before harvest. ◆

Information Sources For NPA, CMP Orders

The following table is designed to enable persons desiring information on NPA M-Orders and Regulations and CMP Regulations to locate and contact the proper Government official.

Listed in the first column are the M-Order and CMP Regulation Numbers, following are the title of the order or regulation, the name of the administrator (his address and extension phone number), and the agency or division to which he is assigned.

M-ORDER NO.	TITLE	ADMINISTRATOR	DIVISION OR AGENCY
M-4A	Construction	**R. B. Newman** 312 PO Ext 3412	Construction Controls Div., Facilities & Construction Bureau
M-26	Packaging Closures	**H. B. Esselen** 2X6 NGG Ext 5811	Containers & Packaging Div., Chemical, Rubber & Forest Prod. Bur.
M-31	Chlorine	**Vernon Clark** 2Y12 NG Ext 4360	Chemical Div., Chemical, Rubber & Forest Prod. Bur.
M-32	Chemicals (Limitation for D O Rated Orders)	**Frederick Arden** 2Y14 NG Ext 3114	Chemical Div., Chemical, Rubber & Forest Prod. Bur.
M-44	Power Equipt.-Prod. and Delivery	**L. D. Shank** 2N15 NG Ext 3256	Electrical Equipt. Div., Industrial & Agric. Equipt. Bur.
M-45	Allocation of Chemicals and Allied Products	**Osgood Tracy** 2Z15 NG Ext 4202	Chemical Div., Chemical, Rubber & Forest Prod. Bur.
M-69	Sulfur	**J. F. Wood** 2Y11 NG Ext 3637	Chemical Div., Chemical, Rubber & Forest Prod. Bur.
M-71	Priorities Assistance to Tech. & Scientific Labs.	**W. Thompson** 2245 TT Ext 5150/5089	Scientific & Tech. Equipt. Div., Textile, Leather & Spec. Equipt. Bur.
M-75	Steel Shipping Drums	**Gregory Lanigan** 285 NG Ext 3948/9	Containers & Packaging Div.
M-76	Maintenance, Repair, Operating Supplies & Capital Additions for the Mining Industry	**L. M. Case** 3E7 NG Ext 5018	Mining Mach. Div., Ind. & Agric. Equipt. Bur.
M-94	Sulfuric Acid	**J. G. McMullin** 2Z10 NG Ext 4886	Chemical Div., Chemical, Rubber & Forest Prod. Bur.
NPA REG. NO.			
1	Inventory Control	**J. F. Skillam** 312 NG Ext 5291	Control Operations Div., Policy Coordination Bur.
2	Basic Rules of the Priorities System	**W. C. Groce** 235 PO Ext 5101	Priorities & Directives Div., Policy Coordination Bur.

(Continued on page 45)

FROM FIRST COST TO LAST

LESS PACKAGING EXPENSE

WITH

CHEM-PAK

DEPENDABLE SIFT-PROOF PAPER BAGS SPECIALLY ADAPTED FOR SHELF-UNIT PACKAGING OF CHEMICAL PRODUCTS

CHEM-PAK

BAG TYPES FOR MANY NEEDS

Heavy-duty construction; wax-treated or asphalted paper when desirable
Paper combinations to protect against moisture, odor, grease, vapor, etc.
Excellent printing characteristics
Cut so paste can't ooze
Protective "shingle" construction; no open area through which contents can sift

CHEM-PAK STANDARD

Made with the original and justly famous Union sift-proof feature.

Thermoplastic applied to inside top portion of bag
Closure can be made on standard heat-sealing equipment
Paper combinations to suit the individual protective qualities desired
Excellent printing surface for shelf display packages
Bottom has famous Union sift-proof "shingle" construction

CHEM-PAK UNISEAL

Standard CHEM-PAK with a thermoplastic application to effect a heat sealed closure.

Can be closed on standard heat-sealing equipment
Heat-sealing top guarantees a sift-proof closure
Unithene, chemically inert lining for packing Class "B" poisons, corrosive and hygroscopic chemicals
Bottom squares out flat for easier packaging, better shelf display
Bottom both heat sealed and adhesive reinforced

CHEM-PAK UNITHENE*

Special Duplex paper combination. Inner ply – Unithene.*

*UNITHENE—*Union high-test kraft with control-coated polyethylene.*

VERSATILE CHEM-PAK bags are certified sift-proof. They meet requirements of the Interstate Commerce Commission – are safe even for Class "B" poisons. You'll find them an excellent solution for most packaging problems where dry chemicals are put up in units of twenty-five lbs. or less.

CHEM-PAKS are made in a wide range of paper combinations and closures, suitable for almost any dry chemical sold in small retail units. Their protective qualities compare favorably with more expensive containers. They are easy to handle, inexpensive to pack and ship, colorfully suited to retail display.

Measure your present package against CHEM-PAK. You can make a quick, accurate appraisal with Union's new Chemical *Package Evaluator*. This handy guide is yours for the asking. The coupon brings it.

UNION'S MODERNIZED PLANT AT HUDSON FALLS, N. Y.
BILLION-BAG SPECIALTY PACKAGING HEADQUARTERS

NEW! Mail this coupon for practical CHEMICAL PACKAGE EVALUATOR. No charge or obligation.

Union Bag & Paper Corporation
Woolworth Building, New York 7

Please send me the new Chemical *Package Evaluator*.

Name _____ Title _____
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Products _____

CHEM-PAK

SIFT-PROOF PAPER BAGS FOR CHEMICAL PRODUCTS

UNION BAG & PAPER CORPORATION

NEW YORK: WOOLWORTH BUILDING • CHICAGO: DAILY NEWS BUILDING

CHEM-PAK BAGS FOR FERTILIZERS—INSECTICIDES, FUNGICIDES, DUSTING POWDERS—PLANT FOODS—WALL SIZE—PASTE FLOUR—PATCHING PLASTER—PREPARED CEMENT—PLASTER OF PARIS—PHARMACEUTICAL CHEMICALS—DYES AND PIGMENTS—SANITARY CHEMICALS—POWDER SHAMPOOS—CHLORINE COMPOUNDS AND ALKALIDES—CAULKING, SEALING, WHITING AND FILLING COMPOUNDS—AND OTHER DRY CHEMICALS WITH COMPARABLE PACKAGING REQUIREMENTS

FERTILIZER MATERIALS MARKET

New York

March 17, 1952

Sulfate of Ammonia

This material was moving more freely because of the better demand from the mixers. In event of a steel strike, production will fall rapidly at a time when the demand will be at a peak from the consumers.

Nitrate of Soda

Arrivals continued to come in at various ports and demand was about normal for this time of year, with no price changes noted.

Ammonium Nitrate

Demand continued heavy for this material with producers unable to satisfy the demand for nearby shipment. One producer recently named a price of $72.00 per ton, f.o.b. Niagara Falls.

Nitrogenous Tankage

Demand continues excellent for this material for both immediate and nearby shipment but producers are sold ahead on contract and cannot offer. Last sales made on basis of $4.90 ($5.95 per unit N), f.o.b. various points.

Castor Pomace

Demand is still greater than the supply available and sales are made from time to time when material becomes available at the unchanged price of $37.25 per ton, f.o.b. production points, for material guaranteed 6.75 per cent ammonia.

Organics

Trading in some organic fertilizer materials lagged while other materials were in brisk demand. Soybean meal mineral mixtures were available for prompt shipment at prices as low as $82.00 per ton, f.o.b. Decatur, Ill. in bulk. No straight meal was offered, however, and no linseed meal was available in any direction. Cottonseed meal continued to move mostly for 60 day delivery at various ceiling prices according to location of shipping point. Tankage last sale at $7.00 per unit of ammonia ($8.51 per unit N), f.o.b. Eastern points and blood sold at $7.50 ($9.12 per unit N). Feed buyers were on the sidelines in most cases, which caused lower prices.

Fish Meal

Recent arrivals of imported material at Atlantic and Gulf ports have been of considerable size recently. Demand has slackened from the feed trade with prices tending slightly lower. Some material is offered below the ceiling price of $2.26 per unit of protein.

Bone Meal

While some slight easing was noted in the demand from the feed trade, fertilizer demand increased with stocks inadequate to take care of the demand. Raw bone meal is selling for about $75.00 per ton at the port and steamed feeding grade bone meal at about $85.00 per ton, f.o.b. shipping points.

Hoof Meal

Market continued steady on basis of $7.25 to $7.50 ($8.82 to $9.12 per unit N), f.o.b. domestic shipping points. Some imported material was offered at comparable prices.

Superphosphate

With some mixers still a bit slow to take their contract requirements, no great shortage has so far shown up but some persons feel in another 30 days, when the peak demand is on, the situation will be a lot tighter. Triple super is still in heavy demand from various sections.

Potash

A better demand was noted for this material but stocks from both domestic and foreign sources were ample at this time to take care of the expected demand.

Philadelphia

March 17, 1952

The raw materials market is, in general, rather easy. Tankage and blood show decided weakness, and bone meal is not so urgently in demand. Mixed fertilizer is moving a little better in some sections, but farmers generally are considerably behind schedule in taking deliveries. It is estimated there will be more nitrogen and potash this season than last, but slightly less phosphoric acid.

Sulfate of Ammonia.—There seems to be no evidence of serious shortage in this material, and recent figures show the production in 1951 was quite in excess of 1950.

Nitrate of Soda.—The supply of this material is reported ample to meet requirements, and no price changes recorded.

Cyanamid.—Producers were reported offering to increase contract quantities, which would appear to indicate no particular shortage.

Blood, Tankage, Bone.—Blood and tankage are presently much easier at $6.75 to $7.00 per unit of ammonia ($8.20 to $8.51 per unit N). The demand for bone meal has eased somewhat, but no price changes. Hoof meal is quiet at nominally $7.25 per unit of ammonia ($8.82 per unit N), Chicago basis.

Castor Pomace.—Contract price remains at $37.25 per ton at the producing works, but no additional quantities are being offered.

Fish Scrap.—Absence of any supply of menhaden diverts attention to imported meal. The demand has slowed down somewhat and the ceiling price of $2.26 per unit of protein still prevails.

Phosphate Rock.—Demand and supply are about even for domestic use, and movement is fairly steady on contracts.

Superphosphate.—Production is well sold ahead but in some sections

withdrawals on contract are not up to normal. The supply during the present growing season is expected to be somewhat short of last season.

Potash.—Producers report some improvement in movement against contracts, and, except in a few areas, this is reported about normal. Considerable foreign potash is said to be in storage in this country. It is estimated that there will be a somewhat greater supply of potash this season than last.

Charleston

March 19, 1952

Superphosphate continues in demand greater than apparent supply and is the yardstick governing the amount of mixed goods available for this season. It is reported that in the Baltimore area one producer has advanced his price from 81 cents per unit to 87.7 cents for normal grade. Hard nitrogen for direct application is expected to be short of demand due to strike in production facilities in Chile. Potash is still tight in the Midwest particularly but easier in the Southeast.

Organics.—Rather little activity is noted in the market for current supplies of organics for fertilizer use but some interest in future needs is noted. Domestic nitrogenous tankage continues at $4.25 to $4.90 per unit ammonia ($5.16 to $5.95 per unit N), bulk, f.o.b. production points. Imported nitrogenous tankage is offered in limited quantity at about $6.00 per unit ammonia ($7.29 per unit N), in bags c.i.f. usual Atlantic ports.

Castor Pomace.—Production continues limited and movement primarily against contracts at $37.25 per ton bagged in burlaps with $2.00 per ton allowance if shipped in paper bags. This is for material testing 6.75 per cent minimum ammonia and price is f.o.b. Northeastern production points. Rather little imported castor pomace is offered at prices ranging from $45.00 to $47.50 per ton c.i.f.

Dried Blood.—Unground blood in bulk is nominally $6.75 to $7.00 per unit ammonia ($8.20 to $8.51 per unit N), f.o.b. Chicago area and the New York market is around $7.00 ($8.51 per unit N). Little activity is noted.

Potash.—Active demand is apparent, particularly in the Midwest, with demand tapering off in the lower Southeast. Movement from domestic mines is at peak levels. Prices remain firm and unchanged. Imported muriate in 50 per cent and 60 per cent grades is in comfortable supply position in coastal areas.

Ground Cotton Bur Ash.—Supply position continues comfortable for this potash, primarily in the form of carbonate of potash. Price to most delivery points compares favorably with domestic sulfate of potash.

Phosphate Rock.—Supply and demand are in good balance. No change in prices has been noted.

Sulfate of Ammonia.—Demand is strong and somewhat in excess of supply, particularly in the Midwest. Threatened strike in the steel mills will tighten the market further. Prices remain firm and unchanged ranging from $40.00 per ton to $45.00 per ton bulk, f.o.b. steel mill, in bulk.

Ammonium Nitrate.—This market is exceedingly tight with demand far in excess of supply. Prices remain firm and unchanged with Canadian production at $72.50 bagged, and domestic $63.00/$64.00 bagged, f.o.b. works.

Nitrate of Soda.—Recently a strike developed in the works of the imported material's producers in Chile, which at this writing indicates that supplies for April use in this country will not be available. If the strike is not soon settled, it is indicated that part of May's supplies will also be lacking. Domestic material is short of demand.

Calcium Ammonium Nitrate.—Arrivals recently of good quantities of this imported material testing 20/21 per cent nitrogen are standing in the gap where nitrate of soda is unavailable. Recent cargoes have been rapidly taken up at prices varying from $56.00 to $61.00 per ton, bagged, f.o.b. cars Charleston, S. C. and Braithwaite, La., the only two ports through which this material is imported.

Industrial News

New Products **New Plants** **New Appointments**

4-1 'Halo' Face Shield Protects Against Sparks, Chemicals

An all-green plastic spark protector, which affords wide-angle vision while still eliminating glare from overhead lighting is a feature of the new "Halo" face shield developed by United States Safety Service company.

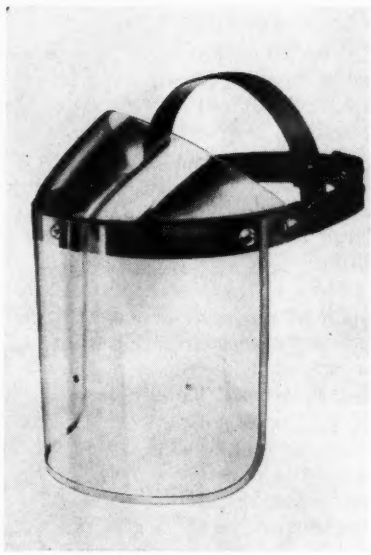
The face shield is attractive, light-weight and insures genuine comfort for the wearer, according to the manufacturer.

It is made of cellulose-acetate-butyrate materials.

A patented visor lock keeps the visor in the "up" or "working" position and eliminates the possibility of the wearer adjusting the visor in such a way that it would not give full safety.

A special acid-resistant visor for use near acids and chemicals is available. The "Halo" face shield is made in three styles for various industrial application.

For further details, fill out a



'Halo' Face Shield

Reader Service Card. Use number **4-1.**

Pennsalt Names Becker To Head Mexican Firm

Alfredo Becker has been named president of Pennsalt de Mexico, S. A., a new member of Pennsalt International Corp. The company has been formed for the manufacturing, packaging and marketing of insecticidal dusts in Mexico.

Located in Mexico City, the new plant will specialize in the production of dusts for control of insects on cotton and beans. BHC, calcium arsenate, DDT, parathion, sulfur and toxaphene are the basic materials used in the formulations.

Local raw materials are to be used whenever possible.

Two other members of the corporation have been put into operation: Pennsalt—Comanl, C. A.' in Maracay, Venezuela, and Pennsalt Industries Quimcas de Brazil, S. A., in Sao Paulo, Brazil.

The Brazilian plant is specializing in dusts and wettable powders for use on coffee and cotton and the Venezuelan operation is production dusts, wettable powders and emulsions for control of cotton pests.

Speaking of the new operations, Richard L. Davies, president of the parent corporation said, "Our company's experience and basic raw material position backed by our research facilities and the marketing facilities of our friends in Central and South America make the formation of these companies a natural development."

Industries Plan New Construction

New construction in farm chemicals and allied industries is headed by plans for $30,000,000 expansion of blast furnace, open hearths, coke ovens and a chemical recovery plant at Harrisburg, Pa. by Central Iron and Steel company.

Other recent plans for fertilizer and pesticide plant construction and expansion includes the following:

D & K Fertilizer company, West Peru, Ind. Contract for construction of new fertilizer plant awarded to Jones Construction company, Logansport, Ind. Estimated cost: $400,000.

Pennsylvania Salt Mfg. company. Contract awarded to Foster-Wheeler corporation, New York City for construction of anhydrous ammonia plant at Wyandotte, Mich. Estimated cost: $3,000,000.

Gulf Oil corporation. Sulfuric acid plant contract awarded to Leonard Construction company, Chicago for construction of facilities at Port Arthur, Tex. Estimated cost: $1,750,000.

E. I. duPont de Nemours & company. Plan construction of fungicide plant at LaPorte, Tex. Estimated cost: $3,500,000.

General Petroleum corporation. DPA certificate awarded for $4,220,000 sulfur and process plant at Worland, Wyo. Certified for $1,259,000 at 70 per cent, $528,000 at 40 per cent and $2,433,000 at 55 per cent.

Allied Chemical & Dye corporation. DPA certificate for construction of lindane production facilities at Marcus Hook, Pa. Certified for $351,000 at 45 per cent.

Revlon Products corporation. DPA certificate for construction of aerosol insecticide plant at Flemington, N. J. certified for $44,490 at 45 per cent.

Allied Chemical & Dye corpora-

Industrial News

tion. DPA certificate for sulfuric acid facilities at Port Chicago, Calif. Certified for $1,067,000 at 70 per cent.

Monsanto Chemical company. DPA certificate for sulfuric acid facilities at Monsanto, Ill. Certified for $8,800,000 at 70 per cent.

Mechanization Credited For High Fertilizer Sale

Minnesota Farm Bureau Service Company, Moorhead, Minn., sold 20,000 tons of high analysis fertilizer in North Dakota last year. The firm is an affiliate of the Minnesota Farm Bureau and is allied closely to that organization's large fertilizer plant at St. Paul, Minn.

Most of the Moorhead fertilizer made at the large new plant is the product of mechanization from top to bottom. The report of sales by the Moorhead plant, managed by C. R. Yernberg, was given in February by Harold D. Goeway, general sales manager of the Minnesota Farm Bureau.

The plant serves Minnesota and South Dakota also and has six agents in the field selling such products as their new 0–30–30 for legumes as alfalfa. Insecticides and weed killers are produced by a big St. Paul plant.

Want Ads

Wanted: Reliable and experienced manager for fertilizer division. Know buying, formulation and plant operations. State salary expected. Address "360" care FARM CHEMICALS, Philadelphia 7, Pa.

Wanted: Plant superintendent for modern, new plant now under construction in Middle West. Well-rounded, previous experience necessary, including background in formulations and labor relations. Prefer man under 40. Salary open. Address "370" care FARM CHEMICALS, Philadelphia 7, Pa.

4-2 Feed Packaged Unit

A unit specially designed for delivering chemicals and other fluids for processing or for feeding boiler water treatment has been devised by Bird-Archer company.

The new chemical feed packaged unit is self-contained and offers high pressure feed at low cost, according to the company.

Construction of the reservoir tank is of welded steel, available in 50 or 100 gallon capacity. Various rates of feed at different pressures may be obtained through a specially designed pump for individual needs in industrial plants.

Completely mixed fluids are maintained by a special motor-driven agitator, Bird-Archer states. A stainless steel strainer is provided between the suction side of the pump and the tank. The pump is mounted below the tank to minimize air binding and to maintain a positive suction head. All necessary piping is supplied with the unit.

For more information on the feed unit, fill out a **Reader Service Card,** with number **4-2.**

International Min. Expands Industrial Sales Department

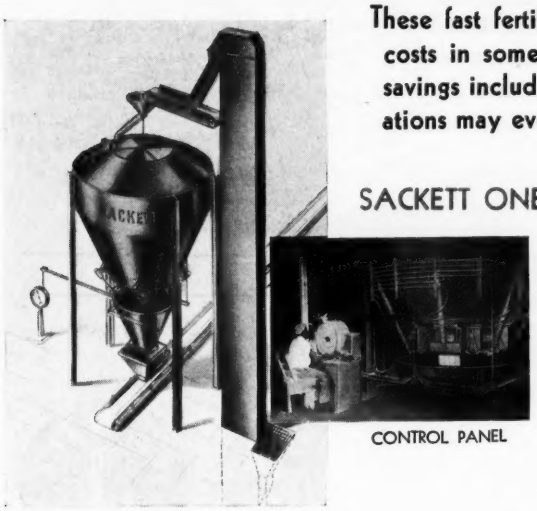
Expansion of the Industrial Sales Department of the Potash Division, International Minerals & Chemical Corp., has been announced. It results from the increased volume of chemical production since the purchase of Innis, Speiden & Company by IMC in July, 1951.

The department has been responsible for sale of technical and chemical grades of potassium chloride and sulfate and now also is selling caustic potash, potassium carbonate, chlorine and other chlorinated products.

Carl H. Barber and J. A. Sheehan have been added to the Chicago staff and Paul W. Hiller and John E. Batchelder to the New York office. Hiller is New York district manager of sales.

A newly created technical service has been developed for the department and is under T. E. Allen.

SACKETT FERTILIZER PROCESSING SYSTEMS PAY OFF



These fast fertilizer processing systems have reduced production costs in some plants as much as 65% . . . An estimated cost savings included with a Sackett survey of your production operations may even exceed this figure.

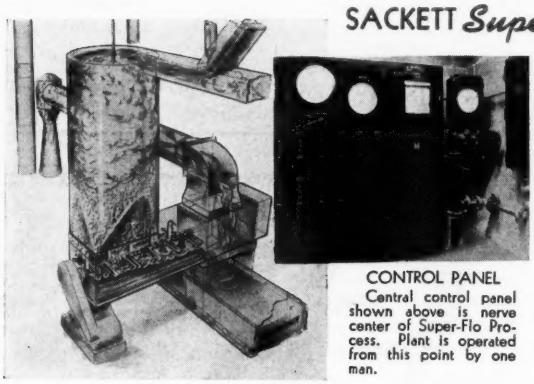
SACKETT ONE MAN BATCH-WEIGH SYSTEM

CONTROL PANEL

1. liminates waste of manpower.
2. Fast-acting weigh valves and printed weigh record provides more rapid and accurate weighing.
3. Circular design of storage hopper accelerates flow of ingredients through weigh valves . . . no corners or valley angles to retard flow of material.
4. Its compact design permits installation in existing buildings with minimum alterations.
5. The installation of this system does not, in any way, disturb existing mixing facilities.

Built in four sizes, 25 tons to 100 tons per hour.

SACKETT *Super-Flo*... A CONTINUOUS SUPERPHOSPHATE MANUFACTURING PROCESS



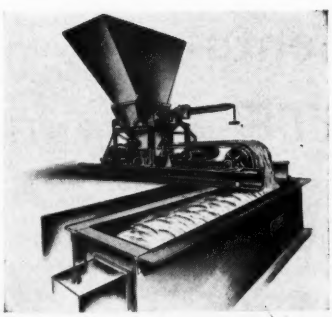
CONTROL PANEL
Central control panel shown above is nerve center of Super-Flo Process. Plant is operated from this point by one man.

This new Sackett-conceived and developed process produces a superphosphate of premium quality in either powdered or granular form. Its complete mechanization and centralized panel control brings to the industry entirely new conceptions of high production speeds, low manufacturing costs and quality product control.

These Sackett patented processes are built in three sizes, 25 tons to 75 tons per hour.

Exclusive suspended acidulation produces highly converted superphosphate of excellent quality.

SACKETT CONTINUOUS AMMONIATING SYSTEM



The patented Sackett Continuous Ammoniation System is now being offered in four sizes with capacities ranging from 25 tons per hour to 100 tons per hour. This highly efficient method of ammoniating superphosphates and mixed goods with solutions offers many important advantages and is easily installed in connection with existing basing equipment. Higher ammoniation rates are made possible by its accurate proportioning of solids and solutions and lower reactive temperatures due to its exclusive aerating action which takes place during ammoniation. This system is also built in pressurized design for anhydrous ammonia or solutions having high vapor pressures.

SACKETT
BALTIMORE

America's Foremost Designers and Builders

SUPERPHOSPHATE PLANTS • FERTILIZER MIXING PLANTS • RELATED PRODUCTION EQUIPMENT

THE A. J. SACKETT & SONS CO., 1707 S. HIGHLAND AVENUE, BALTIMORE 24, MD.

Architects and Manufacturing Engineers to the Fertilizer Industry since 1897

Industrial News

Allstetter Is Appointed Vice President of NFA

W. R. Allstetter has been named vice president of the National Fertilizer Association. Now serving as Deputy Director of the Office of Materials and Facilities in charge of Fertilizer and Agricultural Chemicals programs, USDA, he will assume his new duties on April 1.

Allstetter is a graduate of Swarthmore College and attended Yale Law School. In addition to his USDA work, he served four years with the Army Corps of Engineers.

Allstetter has been closely associated with the fertilizer industry for many years, first through his interest in a fertilizer company and more recently through his activities in connection with the Fertilizer Industry Advisory committees.

Na-Churs Plant Food Opens New Ohio Plant

A new factory in Marion, O., has been opened by Na-Churs Plant Food company. Newly installed process machinery permits the company to increase the formula of its liquid fertilizer from 5–10–5 to 7–14–7.

In addition to office, manufacturing and storage areas the steel and masonry structure contains complete facilities for chemical analysis and research. Full time work is planned for the laboratory including field tests on fertilization methods.

Tax Tag Sales Decline After Record in 1951

Tax tag sales and shipment reports from 14 states indicate a record high in volume of 11,295,696 tons of fertilizer for 1951. Although a 4.4 per cent increase was shown over 1950 sales, a drop of .7 per cent was shown for the last half of the vear.

January sales, based on reports from 12 states, continued the decline, dropping 22 per cent below those of a year ago to 909,884 tons.

A 26 per cent decrease was noted in the South and 12 per cent in the Midwest.

Sulfur Advisory Committee Reports Stocks on Hand

Members of the Native Sulfur Industry Advisory committee were told recently stocks of sulfur in the hands of producers January 31 amounted to 2,851,212 tons, an increase of 13,780 tons over that on hand December 31, 1951.

It was pointed out by committee members that the net gain was not significant because shipments to customers generally are low during January. Both government and industry members agreed that order M-69 is achieving a balance between available supplies and sulfur requirements.

RAYMOND
MULTI-WALL PAPER SHIPPING SACKS

. . . the Fertilizer Paper Shipping Sacks that are as fresh and clean as Easter flowers.

Your fertilizers, when packed in these better quality, attractively printed Paper Shipping Sacks, will appeal to the quality buyer.

Raymond Multi-Wall Paper Shipping Sacks are CUSTOM BUILT in various types, sizes, and strengths. They are available printed or plain.

Raymond will be glad to assist you in selecting the perfect Shipping Sack for your particular packing and shipping needs. Wire, write, or phone today.

THE RAYMOND BAG COMPANY, Middletown, O.

Industrial News

NPA Reviews Requests For Nitrogen Expansion

Members of the Nitrogen Industry Advisory committee were told recently that 23 applications for rapid tax amortization certificates for expansion of nitrogen producing facilities are being reviewed. These applications cover a proposed expansion of over one million tons of nitrogen, more than twice the 431,000-ton goal set by the Defense Production Administration as needed to meet estimated nitrogen requirements by 1955.

NPA officials told committee members preference would be given to plants to be erected in areas where USDA surveys indicate a deficit in availability of nitrogenous materials.

In addition special consideration will be given to plants in which urea or other solid forms of nitrogen will be produced, in accordance with the USDA recommendation of preference for the solid forms.

Other factors which will be considered in reviewing applications include experience in production of chemicals and allied processing operations, opportunity for small business participation, and conservation of natural resources.

It was pointed out that more than enough anhydrous ammonia to meet 1955 requirements will be produced by present and proposed facilities. A USDA spokesman said that only 120,000 tons of additional ammonia is needed to meet the department's expected added annual requirements for agricultural nitrogen in 1955.

Production of Super Rises During 1951

An increase of 348,000 tons in superphosphate production in 1951 has been reported. A total of 11.2 million tons of the material, 18 per cent APA basis, were manufactured.

Production of concentrated superphosphate also reached a new high when 717,000 tons were made during the year. This topped the previous record high set in 1950 by 30,000 tons.

Grosselfinger Gets Post With Synthetic Nitrogen

Synthetic Nitrogen Products corporation has appointed F. B. Grosselfinger new technical director. He formerly was employed by Hydrocarbon Research, Inc., working on process development and sales engineering.

Mr. Grosselfinger was graduated from MIT, receiving degrees in chemical engineering. He spent five years in the Signal Corps as a lieutenant colonel and was chief signal officer of the Rome Allied Command. While in Italy he was knighted in the Order of the Crown of Italy and was awarded a Bronze Star.

Information Sources . . .

(*Continued from page 32*)

NPA REG. NO.	TITLE	ADMINISTRATOR	DIVISION OR AGENCY
5	Appeals	**T. M. Boyd** 5800 Comm Ext 3820	Appeals Board
6	Transfer of Quotas & Ratings; Transfer of a Business as a Going Concern	**J. F. Skillman** 312 NG Ext 5291	Control Operations Div., Policy Coordination Bur.
CMP REG. NO.			
1	Basic Rules of the Controlled Materials Plan	**J. F. Skillam** 312 NG Ext 5291	Control Operations Div. Policy Coordination Bur.
2	Inventories of Controlled Materials	**N. B. Salant** 2U8 NG Ext 5291	Control Operations Div. Pollcy Coordination Bur.
3	Basic Rules of the Controlled Materials Plan-Preference Status of Delivery Orders	**J. F. Skillman** 312 NG Ext 5291	Control Operations Div., Policy Coordination Bur.
5	Maintenance, Repair, and Operating Supplies and Minor Capital Additions Under the CMP	**F. M. Bernfield** 233 PO Ext 5718/ 4652	Priorities & Directives Div., Policy Coordination Bureau
6	Construction Under the CMP	**J. F. Skillman** 312 NG Ext 5291	Control Operations Div., Policy Coordination Bur.

NG —National Production Authority, New GAO Bldg., Wash. 25, D. C.
TT —National Production Authority, Old GAO Bldg., Wash. 25, D. C.
PO —National Production Authority, Pension Office Bldg., Wash. 25, D. C.

Toxaphene Near Cows Safe in Small Amounts

Experiments have shown that it apparently is safe to spray dairy cows with five-tenths per cent toxaphene prepared from wettable concentrates, according to R. E. Leighton, associate professor of dairy husbandry at Texas A. and M. College.

Prof. Leighton reported on tests by research workers during 1950 at the Texas Agricultural Experiment Station. They show that small amounts of toxaphene apparently are not harmful to dairy cattle.

Amounts varying from 2½ to 37½ grams of toxaphene per day were fed to four Jersey cows. None of the cows showed any harmful effects in dosages of up to five grams a cow daily.

Brazilian Sulfur Imports Show Big Drop in 1951

Tight supplies in exporting countries caused an estimated 40 per cent drop in Brazilian sulfur imports last year.

Total imports of sulfur in Brazil during the first half of 1951 were 19,621 tons, compared with 33,453 tons in the first half of the previous year, according to the Brazilian Bulletin.

The United States was the main supplier for that period, supplying 13,993 tons of the material.

Mist-o-cide

(*Continued from page 18*)

the men who developed the product.

Fancher and Peer say they got into the pesticide field and developed their product backwards. First they made a chemical discovery and then found it was useful for pest control.

The scientists said the chemical reaction which is the basis of the new generator is unique in the field of thermal reactions, but they cannot discuss it fully until patent processing becomes final sometime this year.

Fancher and Peer met in Pasedena, Calif., where they attended Pasadena Junior College. They completed their chemical educations at the University of California at Berkeley, joined the U. S. Steel corporation in the Columbia Steel plant laboratories and in 1942 set up a commercial lab in San Francisco.

Their laboratories were organized as Multiphase, Inc., in 1945. They still are active in research and consulting in the field of applied chemistry.

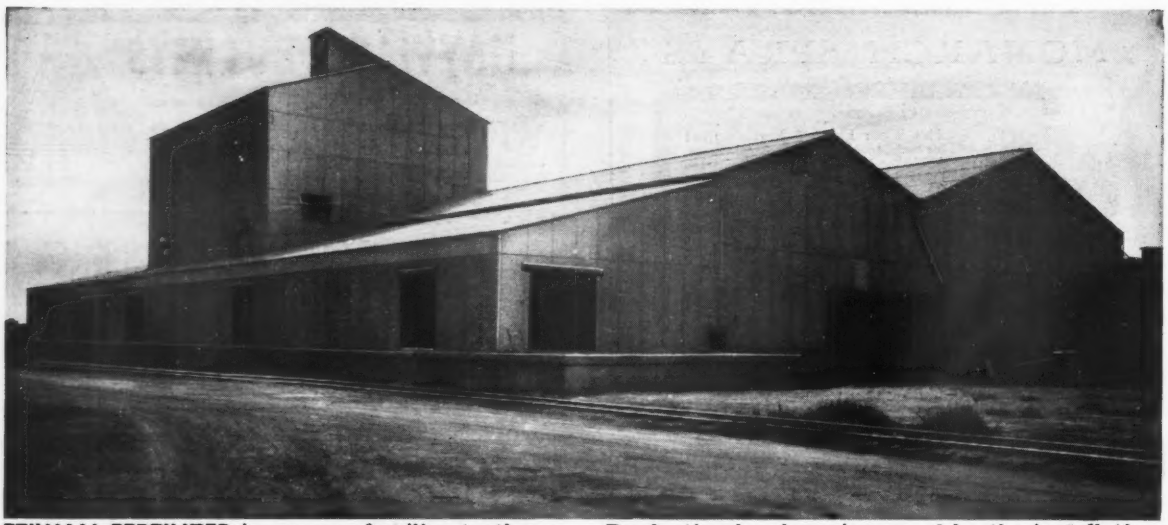
The men devoted spare time to the pesticide project until it reached the commercial stage.

Numerous important applications of the Mist-o-cide generator have been found. The unit has use in storage warehouses, basements, attics, garages, houses, theaters, libraries, museums, art galleries, food-packing and storage plants and many other places.

Farm uses for the generator include mushroom houses, barns and storage sheds. Naturally several of the applications listed are eliminated for the DDT-Chlordane formulation because of recent restrictions on those chemicals, but new formulations with other insecticides soon will be made, Fancher and Peer report.

Possible additional use for the generating principle will be made with fungicides and miticides, the developers stated.

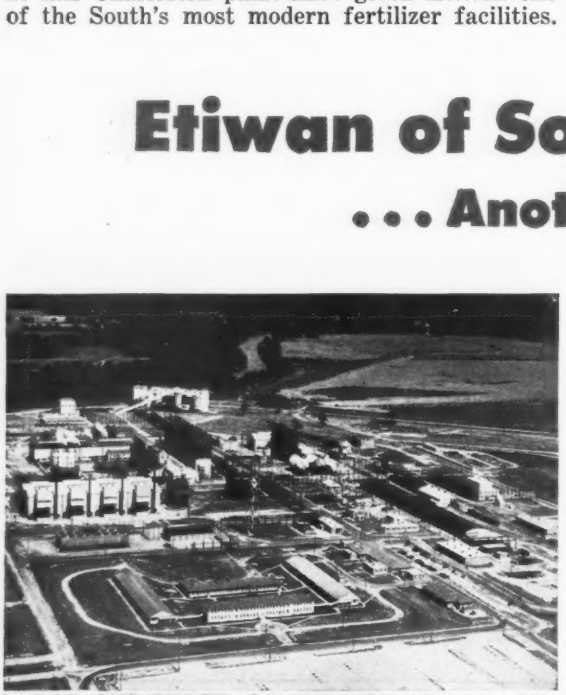
Distribution of the product is made by Mist-o-cide division to key points in the United States to companies which market the product under their own brand names. ◆



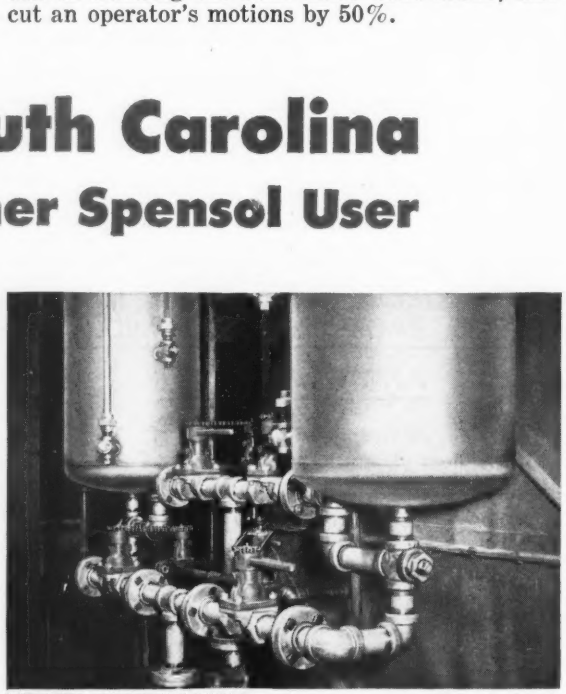
ETIWAN FERTILIZER is a name familiar to thousands of Carolina farmers. Recent improvements at this Charleston plant have given Etiwan one of the South's most modern fertilizer facilities. Production has been increased by the installation of dual measuring tanks. These save time usually lost in refilling the tank after each batch; also cut an operator's motions by 50%.

Etiwan of South Carolina

. . . Another Spensol User



LARGE QUANTITIES OF SPENSOL (Spencer Nitrogen Solutions) are produced each day in plants like this. Spensol is preferred by many mixers because of its demonstrated ability to produce well-conditioned fertilizers at low cost.



HERE'S AN EXAMPLE of how our Technical Service Department at Spencer may help you solve a production problem: Spencer's Floyd Miller designed and supervised installation of these dual tanks at the Etiwan plant in Charleston.

SPENSOL® made and sold only by **SPENCER®**

SPENCER CHEMICAL COMPANY, Dwight Bldg., Kansas City 6, Mo.
Southeastern District Sales Office: 412 Chandler Bldg., Atlanta, Ga.
Works: Pittsburg, Kansas • Henderson, Ky. • Chicago, Ill.
Vicksburg, Miss. (Under Construction)

America's Growing Name in Chemicals

How You Can Get

Free Information

On each of the two postage-paid postcards below you can request further information on four items described on this and the Industrial News section of this issue. *Fill out one quarter section for each item in which you are interested.*

4-3 Aerosol Market

Seventy-five per cent of dealers interviewed during a recent DuPont survey of the aerosol market reported they now are stocking one or more pressure-packed aerosol products.

That shows how important and widespread the aerosol market is. It represents an increase in retail outlets of 76 per cent over a similar poll in 1947 when the first survey was made. Purpose of a bulletin on "The Aerosol Market" is to provide the industry with timely data relating to dealer and consumer attitudes and reactions toward the relatively new method of packaging products.

4-4 Lapp Valves

The chemical processing industry knows that valves of Lapp Chemical Porcelain are the most effective for handling many corrosive chemicals, according to the Lapp company.

Porcelain is the body material itself, not a paint or enamel, the manufacturer states. The porcelain is dense, homogeneous, non-porous and acid-resisting. The company states that in many places in the chemical industry the valves have been found the only satisfactory answer to the handling of corrosive chemicals.

4-5 Explosion-Proof Motor

An explosion-proof enclosure is just one of the many advantages of the Elliot Crocker-Wheeler explosion-proof motor, the company states in a recent bulletin. The motor, first produced ten years ago, also is exceptionally cool and clean because of the fan-driven air blast directed along the radial fins. Literature from the company describes the application of the motor for use with chemicals.

4-6 Conveyor Belting

Quaker conveyor belting is fabricated from prime selected duck with friction covers of scientifically compounded, long-lasting rubber. That's one of the reasons the manufacturer claims the belting is one of the leading products of

Here is a list of the NEW PRODUCTS and BULLETINS described on this and the Industrial News pages of this issue giving their monthly code number.

- 4-1 Face Shield
- 4-2 Feed Unit
- 4-3 Aerosol Market
- 4-4 Lapp Valves
- 4-5 Explosion-Proof Motor
- 4-6 Conveyor Belting
- 4-7 Multiclone Collectors
- 4-8 Process Equipment
- 4-9 Bin-Vue Indicator
- 4-10 Plasteel Roofing
- 4-11 Phenoline No. 300
- 4-12 'Pie-Flex' Mixer
- 4-13 Power Transmission
- 4-14 Machinery Parts

FILL OUT READER SERVICE CARDS

FARM CHEMICALS Code Number

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Company.....
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Co. Address.....
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its kind in the United States. The belting is built to resist weather, shock, abrasion and rusting, according to a pamphlet on the material.

4-7 Multiclone Collectors

No other mechanical recovery equipment has so many years of dust and fly ash recovery experience behind it, the makers of Multiclone collectors assert in a booklet about their product. It's no wonder, according to the company, that Multiclone is the leading name in the centrifugal recovery of dust from all types of gases, hot or cold. Four advantages of the unit are uniformly high recovery, space-saving compactness, maximum adaptability and minimum maintenance.

4-8 Process Equipment

If your processing calls for acids, alkalies, salts or solvents, specify Haveg equipment, is the advice of the company. Literature on the Haveg line describes their processing equipment which they say is especially resistant to almost all of these substances. Haveg is not a lining, coating or film but a chemically resistant structural plastic, the manufacturer says.

4-9 Bin-Vue Indicator

Positive, fool-proof signals are assured under pressure of a vacuum with the new Convair Bin-Vue bin level indicator, the manufacturer states in a bulletin on the product. The indicator has no diaphragms to give false signals, no intricate parts, no tricky adjustments—just sure, positive automatic indication at top, middle or bottom of the bin, according to Convair. A simple mechanical reaction to any dry bulk material is the principle that assures true signals and trouble-free operation.

4-10 Plasteel Roofing

Mica is the big difference in Plasteel corrugated roofing and siding which has application in the farm chemicals industries. A Plasteel booklet says the material is made of high-strength steel sheets that combine light weight with durability. A coating of zinc is applied for complete edge protection, followed by a coating of a rust-inhibiting asphaltic bond, into which is impregnated pure mineral mica which adds permanence to the material. Its use for industry plants is described in the literature.

4-11 Phenoline No. 300

The first public announcement of Phenoline No. 300, a modified phenolic coating resin, has been made by Carboline company. After long laboratory and plant tests, the material is now available. It is a resin formulation resulting from a two-year development program on highly modified phenolics for corrosion resisting coatings. The material polymerizes at room temperature in a day or less, is completely resistant to caustic soda, hot or cold and bonds directly to almost any surface, the company explains in a bulletin.

4-12 'Pie-Flex' Mixer

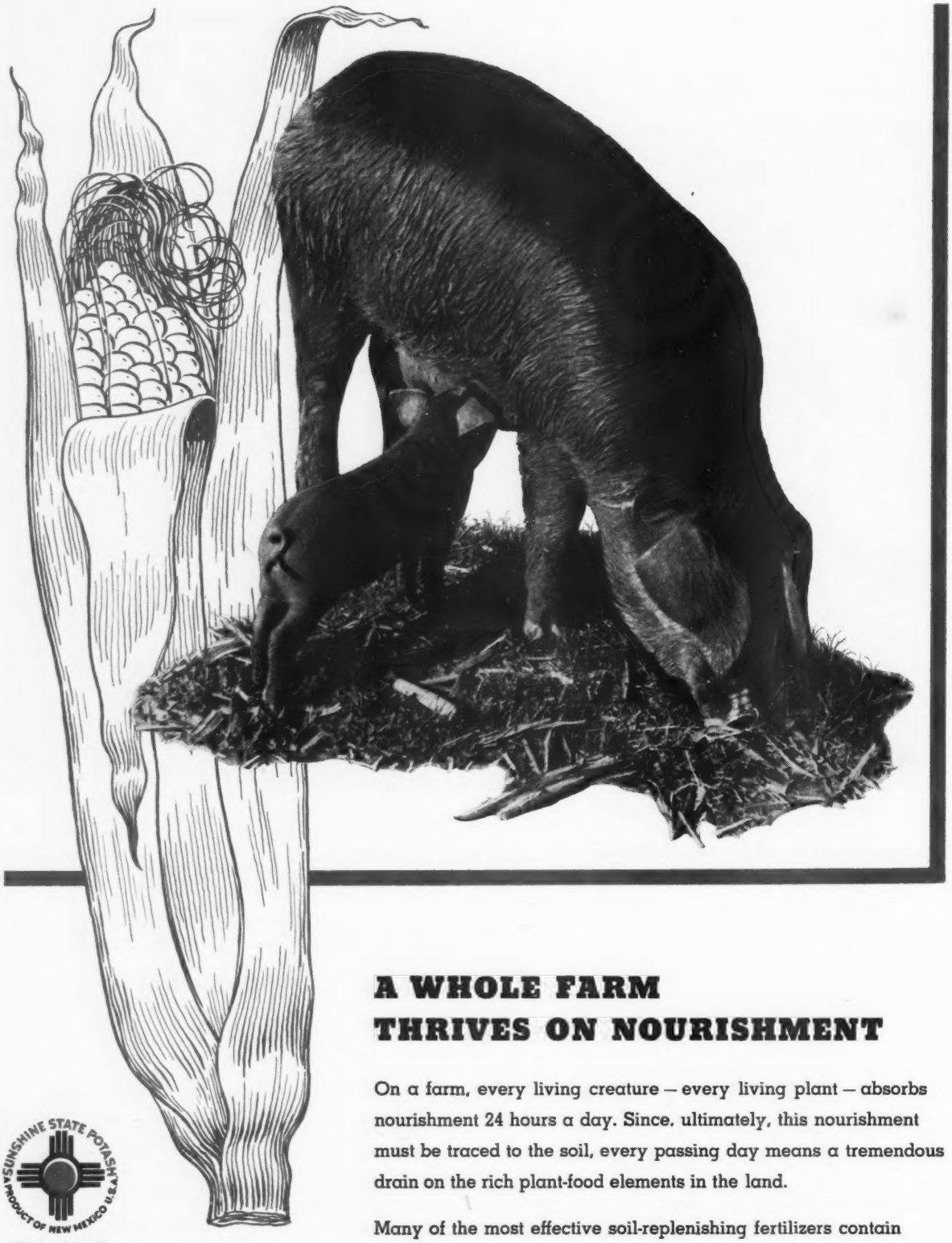
Removal of the motor from the top end of the propeller shaft makes the big difference in the "Pie-Flex" portable mixer. Manufactured by Process Industries Engineers, Inc., the mixer is extremely light and durable. According to company literature, removal of the motor from its customary place reduces the weight by more than half and results in a mixer of simplified design, streamlined and perfectly balanced. With the new arrangement, the mixer is easier to handle, mount in place and adjust to the desired angle. A lever-operated positioning device facilitates this.

4-13 Power Transmission

The most effective method of power transmission serving industry today is packaged, all-electric, adjustable-speed drives, according to a new bulletin of the Reliance Electric & Engineering company. The bulletin gives a simplified, non-technical explanation of the Reliance V-S drive, its economics, application versatility and operational flexibility in providing adjustable speeds from AC circuits. Seven basic functions of this method of power transmission are discussed in the booklet.

4-14 Machinery Parts

Abrasion, corrosion and high-temperature problems face many plants in the farm chemicals field. One answer to the problem is in the use of a wide variety of cast and wrought alloy machinery parts. They are described in a new booklet of Union Carbide and Carbon corporation called "Long-Wearing Machinery Parts." More than 60 blueprints, tables and photographs show some of the sizes and shapes in which the alloy parts are made. Information forms are included in the booklet for industry personnel who have been troubled by a particular machinery part that has failed repeatedly.



SUNSHINE STATE POTASH
PRODUCT OF NEW MEXICO U.S.A.

REG. U. S. PAT. OFF.

HIGRADE MURIATE OF POTASH 62/63% K_2O
GRANULAR MURIATE OF POTASH 48/52% K_2O
MANURE SALTS 20% K_2O MIN.

A WHOLE FARM THRIVES ON NOURISHMENT

On a farm, every living creature – every living plant – absorbs nourishment 24 hours a day. Since, ultimately, this nourishment must be traced to the soil, every passing day means a tremendous drain on the rich plant-food elements in the land.

Many of the most effective soil-replenishing fertilizers contain POTASH . . . often Sunshine State Potash, a product of New Mexico. Such fertilizer is more than a mere soil nutrient. It strengthens the crops . . . effectively helping them to resist disease and drought.

UNITED STATES POTASH COMPANY, Incorporated, 30 Rockefeller Plaza, New York 20, N. Y.

Buyers' Guide

Classified Index to Advertisers in 'Farm Chemicals'

AGRICULTURAL CONSULTANTS
Bailey & Lerch, Washington, D. C.

ALDRIN
Ashcraft-Wilkinson Co., Atlanta, Ga.
General Chem. Div., Allied Chem. & Dye Corp., N. Y. C.

AMMONIA—Anhydrous and Liquor
Barrett Div., Allied Chemical & Dye Corp., New York City
Commercial Solvents Corp., New York City
Lion Oil Co., El Dorado, Ark.
Mathieson Chem. Corp., Baltimore, Md.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM NITRATE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Lion Oil Co., El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo

AMMONIUM PHOSPHATE
Monsanto Chem. Co., St. Louis, Mo

AMMONIUM SULFATE
See Sulfate of Ammonia

BAGS—Burlap
Bemis Bros. Bag Co., St. Louis, Mo.
Mente & Co., Inc., New Orleans, La.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Cotton
Bemis Bro. Bag Co., St. Louis, Mo.
Mente & Co., Inc., New Orleans, La.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Multiwall-Paper
Bemis Bro. Bag Co., St. Louis, Mo.
International Paper Co., Bagpak Div., New York City
Hammond Bag & Paper Co., Wellsburg, W. Va.
Jaite Company, The, Jaite, Ohio
Kraft Bag Corporation, New York City
Mente & Co., Inc., New Orleans, La.
Raymond Bag Co., Middletown, Ohio
Union Bag & Paper Corp., New York City
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Dealers and Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex, M., Charleston, S. C.

BAG CLOSING MACHINES
International Paper Co., Bagpak Div., New York City

BAG CLOSING—THREAD & TWINE
Bemis Bros. Bag Co., St. Louis, Mo.
Mente & Co., Inc., New Orleans, La.

BAG PRINTING MACHINES
Schmutz Mfg., Louisville, Ky.

BAG FILLING MACHINES
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

BHC AND LINDANE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corp., New York City
General Chem. Div., Allied Chem. & Dye Corp., N. Y. C.

BONE PRODUCTS
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID
American Potash and Chem. Corp., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BUCKETS—Hoist, Crane, etc.
Hayward Company, The, New York City

CALCIUM ARSENATE
American Agricultural Chemical Co., New York City
General Chem. Div., Allied Chem. & Dye Corp., N. Y. C.

CARS AND CART
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

CASTOR POMACE
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

CHEMISTS AND ASSAYERS
Gascoyne & Co., Baltimore, Md.
Shuey & Company, Inc., Savannah, Ga.
Wiley & Company, Baltimore, Md.

CHLORDANE
Ashcraft-Wilkinson Co., Atlanta, Ga.
General Chem. Div., Allied Chem. & Dye Corp., N. Y. C.

CLAY
Ashcraft-Wilkinson Co., Atlanta, Ga.

CONDITIONERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C
National Lime & Stone Co., Findlay, Ohio

CONTROL SYSYEMS
Sackett & Sons Co., The A. J., Baltimore, Md.

CONVEYORS—Belt
Sackett & Sons Co., The A. J., Baltimore, Md.

COPPER SULFATE
Andrews Sales, Inc., W. R. E., Philadelphia, Pa.
Phelps Dodge Refining Corp., New York City
Tennessee Corp., Atlanta, Ga.

COTTONSEED PRODUCTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

DDT
Ashcraft-Wilkinson Co., Atlanta, Ga.
General Chem. Div., Allied Chem. & Dye Corp., N. Y. C.
Monsanto Chemical Co., St. Louis, Mo.

DIELDRIN
Ashcraft-Wilkinson Co., Atlanta, Ga.

DILAN
Commercial Solvents Corp., New York City

DILUENTS
Ashcraft-Wilkinson Co., Atlanta, Ga.

DITHIOCARBAMATES
General Chem. Div., Allied Chem. & Dye Corp., N. Y. C.

DRYERS
Sackett & Sons Co., The A. J., Baltimore, Md.

ELEVATORS—Bucket
Sackett & Sons Co., The A. J., Baltimore, Md.

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Stedman Foundry and Machine Co., Aurora, Ind.

ENGINEERS—Chemical and Industrial
Chemical Construction Corp., New York City
Fairlie, Inc., Andrew M., New York City
General Industrial Development Corp., New York City
Marietta Concrete Corporation, Marietta, Ohio
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Titlestad Corporation, Nicolay, New York City

FERTILIZER—Mixed
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Minerals & Chemical Corporation, Chicago, Ill.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Virginia-Carolina Chemical Corp., Richmond, Va.

FILLERS
McIver & Son, Alex. M., Charleston, S. C.

FISH SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

FULLER'S EARTH
Ashcraft-Wilkinson Co., Atlanta, Ga.

FUNGICIDES
American Agricultural Chemical Co., New York City
Andrews Sales, Inc., W. R. E., Philadelphia, Pa.
General Chem. Div., Allied Chem. & Dye Corp., N. Y. C.
Tennessee Corp., Atlanta, Ga.

HERBICIDES
Lion Oil Company, El Dorado, Ark.
Monsanto Chemical Co., St. Louis, Mo.

HERBICIDES—Oils
General Chem. Div., Allied Chem. & Dye Corp., N. Y. C.
Lion Oil Company, El Dorado, Ark.

HOPPERS & SPOUTS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES
American Agricultural Chemical Co., New York City
Andrews Sales, Inc., W. R. E., Philadelphia, Pa.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corp., New York City
Powell & Co., John, New York City
Virginia-Carolina Chemical Corp., Richmond, Va.

IRON SULFATE
Tennessee Corp., Atlanta, Ga.

LEAD ARSENATE
American Agricultural Chemical Co., New York City
General Chem. Div., Allied Chem. & Dye Corp., N. Y. C.

LIMESTONE
American Agricultural Chemical Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio

LOADERS—Car and Wagon
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making and Handling
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Acidulating
Chemical Construction Corp., New York City
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Ammoniating
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Grinding and Pulverizing
Atlanta Utility Works, The, East Point, Ga.
Bradley Pulverizer Co., Allentown, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Material Handling
Atlanta Utility Works, The, East Point, Ga.
Hayward Company, The, New York City
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Mixing, Screening and Bagging
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Power Transmission
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Superphosphate Manufacturing
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MANGANESE SULFATE
McIver & Son, Alex. M., Charleston, S. C.
Tennessee Corp., Atlanta, Ga.

MANURE SALTS
Potash Co. of America, New York City

MINOR ELEMENTS
Andrews Sales, Inc., W R.. E., Philadelphia, Pa.
Tennessee Corporation, Atlanta, Ga.

MIXERS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

NITRATE OF SODA
American Agrictultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Barrett Div., Allied Chemical & Dye Corp., New York City
International Minerals & Chemicals Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NITROGEN SOLUTIONS
Barrett Div., Allied Chemical & Dye Corp., New York City
Lion Oil Company, El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

NITROGEN MATERIALS—Organic
American Agriculture Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray
Monarch Mfg. Works, Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

PARATHION
Ashcraft-Wilkinson Co., Atlanta, Ga.
General Chem. Div., Allied Chem. & Dye Corp., N. Y. C.
Monsanto Chemical Co., St. Louis, Mo.

PENTACHLOROPHENOL
Monsanto Chemical Co., St. Louis, Mo.

PHOSPHATE ROCK
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

Buyers' Guide

Classified Index to Advertisers in 'Farm Chemicals'

PHOSPHORIC ACID
American Agricultural Chemical Co., New York City
General Chem. Div., Allied Chem. & Dye Corp., N. Y. C.
Monsanto Chemical Co., St. Louis, Mo.

PLANT CONSTRUCTION—Fertilizer and Acid
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Fairlie, Inc., Andrew M., New York City
General Industrial Development Corp., New York City
Monsanto Chemical Co., St. Louis, Mo.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Titlestad Corporatian Nicolay, New York City

POTASH—Muriate
American Potash & Chemical Corp., New York City
Ashcraft-Wilkinson Co., (Duval Potash) Atlanta, Ga.
International Minerals & Chemical Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Potash Co. of America, New York City
Southwest Potash Corp., New York City

POTASH—Sulfate
American Potash & Chemical Corp., New York City
International Minerals & Chemical Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Potash Co. of America, New York City

POTASSIUM PHOSPHATE
Monsanto Chem. Co., St. Louis, Mo.

PRINTING PRESSES—Bag
Schmutz Mfg. Co., Louisville, Ky.

PYROPHYLLITE
Ashcraft-Wilkinson Co., Atlanta, Ga.

REPAIR PARTS AND CASTINGS
Atlanta Utility Works, The, East Point, Ga
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

SACKING UNITS
Sackett & Sons Co., The A. J., Baltimore, Md.

SCALES—Including Automatic Baggers
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

SCREENS
Atlanta Utility Works, The East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

SEPARATORS—Air
Sackett & Sons Co., The A. J., Baltimore, Md.

SOIL TESTING APPARATUS
La Motte Chemical Products Co., Baltimore, Md.

SPRAYS
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

STORAGE BUILDINGS
Marietta Concrete Corporation, Marietta, Ohio

SULFATE OF AMMONIA
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Barrett Div., Allied Chemical & Dye Corp., New York City
Jackle, Frank R., New York City
Koppers Co., Inc., Tar Products Div., Pittsburgh, Pa.
Lion Oil Co., El Dorado, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Phillips Chemical Co., Bartlesville, Okla.
United States Steel Corp., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFATE OF POTASH—MAGNESIA
International Minerals & Chemicals Corporation, Chicago, Ill.

SULFUR
Ashcraft-Wilkinson Co., Atlanta, Ga.
General Chem. Div., Allied Chem. & Dye Corp., N. Y. C.
Texas Gulf Sulphur Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFUR—Dusting & Spraying
Ashcraft-Wilkinson Co., Atlanta, Ga.
U. S. Phosphoric Products Div., Tennessee Corp., Tampa, Fla.

SULFURIC ACID
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Minerals & Chemical Corporation, Chicago, Ill.
Lion Oil Company, El Dorado, Ark.
Monsanto Chemical Co., St. Louis, Mo.
McIver & Son, Alex. M., Charleston, S. C.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U.S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

SUPERPHOSPHATE
American Agricultural Chemical Co. New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U.S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va
Woodward & Dickerson, Inc., Philadelphia, Pa.

SUPERPHOSPHATE—Concentrated
Armour Fertilizer Works, Atlanta, Ga.
International Minerals & Chemical Corporation, Chicago, Ill.
U.S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TALC
Ashcraft-Wilkinson Co., Atlanta, Ga.

TANKAGE
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Minerals & Chemical Corporation, Chicago, Ill
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TEPP
Monsanto Chemical Co., St. Louis, Mo.
Virginia-Carolina Chemical Corp., Richmond, Va.

TOXAPHENE
Ashcraft-Wilkinson Co., Atlanta, Ga.
General Chem. Div., Allied Chem. & Dye Corp., N. Y. C.

2, 4-D
General Chem. Div., Allied Chem. & Dye Corp., N. Y. C.
Monsanto Chemical Co., St. Louis, Mo.

2, 4, 5-T
General Chem. Div., Allied Chem. & Dye Corp., N. Y. C.
Monsanto Chemical Co., St. Louis, Mo.

UREA & UREA PRODUCTS
Barrett Div., Allied Chemical & Dye Corp., New York City

VALVES
Atlanta Utility Works, The, East Point, Ga.
Monarch Mfg. Works, Inc., Philadelphia, Pa
Sackett & Sons Co., The A. J., Baltimore, Md.

ZINC SULFATE
Tennessee Corp., Atlanta, Ga.

Alphabetical List of Advertisers

Superphosphate equipment at new Min. & Chem. plant.

Completely mechanized

Fertilizer Plant

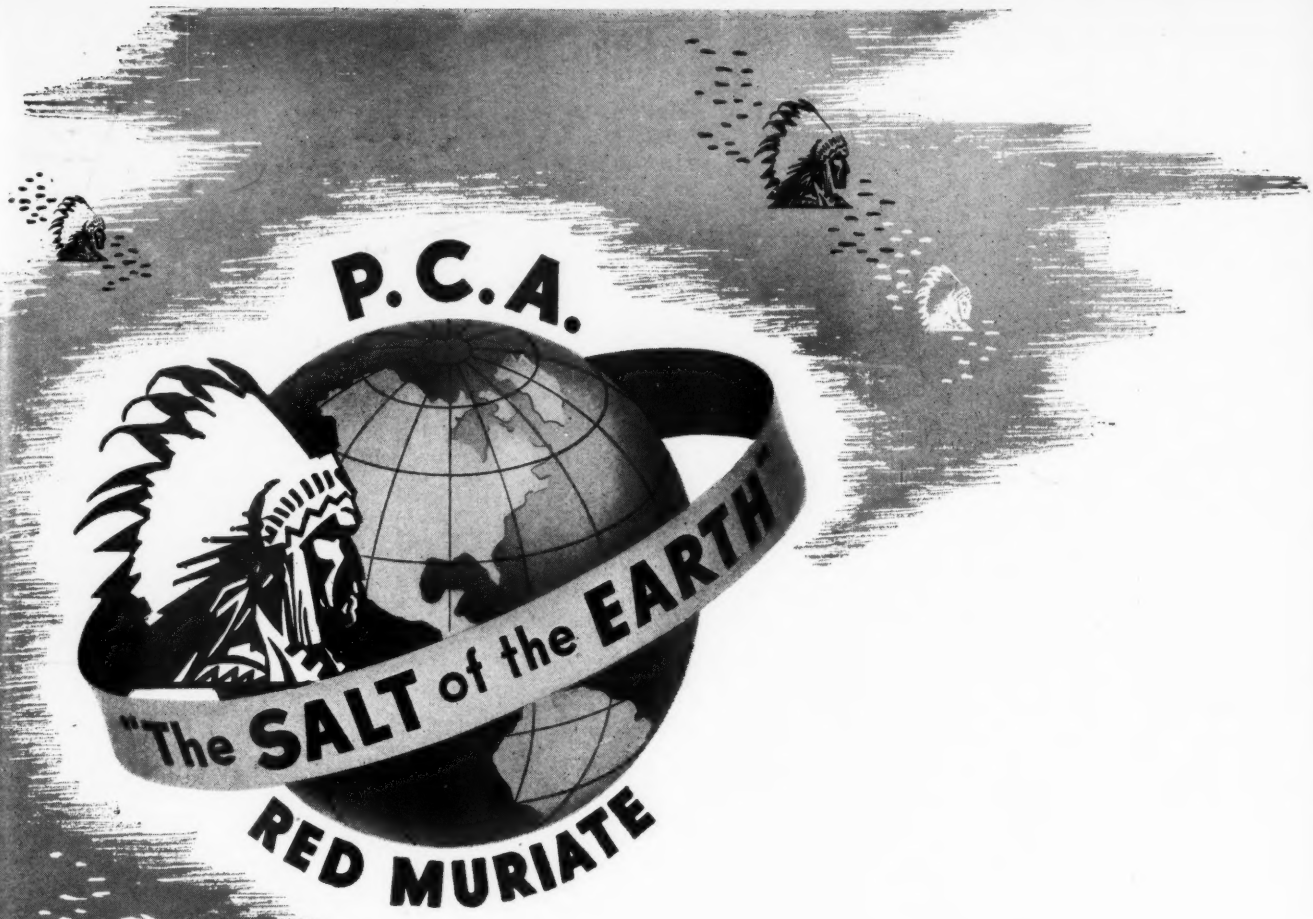
The largest phosphate mining company in the Western Hemisphere took a big step last month toward increasing production of superphosphate and mixed plant foods in the United States.

When its new chemical fertilizer plant was formally opened in Fort Worth, Tex., March 6, International Minerals & Chemical corporation started production of super and mixed plant foods that will amount to 60,000 tons a year. The material is intended for application to wheat, hay, corn, cotton truck and pasture crops in the Southwest.

The plant, dedicated with an all-day open house and inspection for approximately 1,000 dealers, salesmen, customers and reporters, is another in the many constructed by the company in its steady program of expansion.

The plant is the twenty-sixth erected by the company for production of commercial fertilizer. From 15 to 20 types of plant foods will be produced.

Operations at the plant are completely mechanized. Phosphate, ground to a dust at International's mines, is pumped through pipes with air in a recently developed "airveyor" system. The phosphate is treated with sulfuric acid in a mechanically operated den, where it becomes superphosphate. Overhead belt conveyors carry the super to a storage building for curing. A combination milling and bagging unit in the storage building delivers the super to cars or trucks or to fertilizer operations in the main building of the plant.



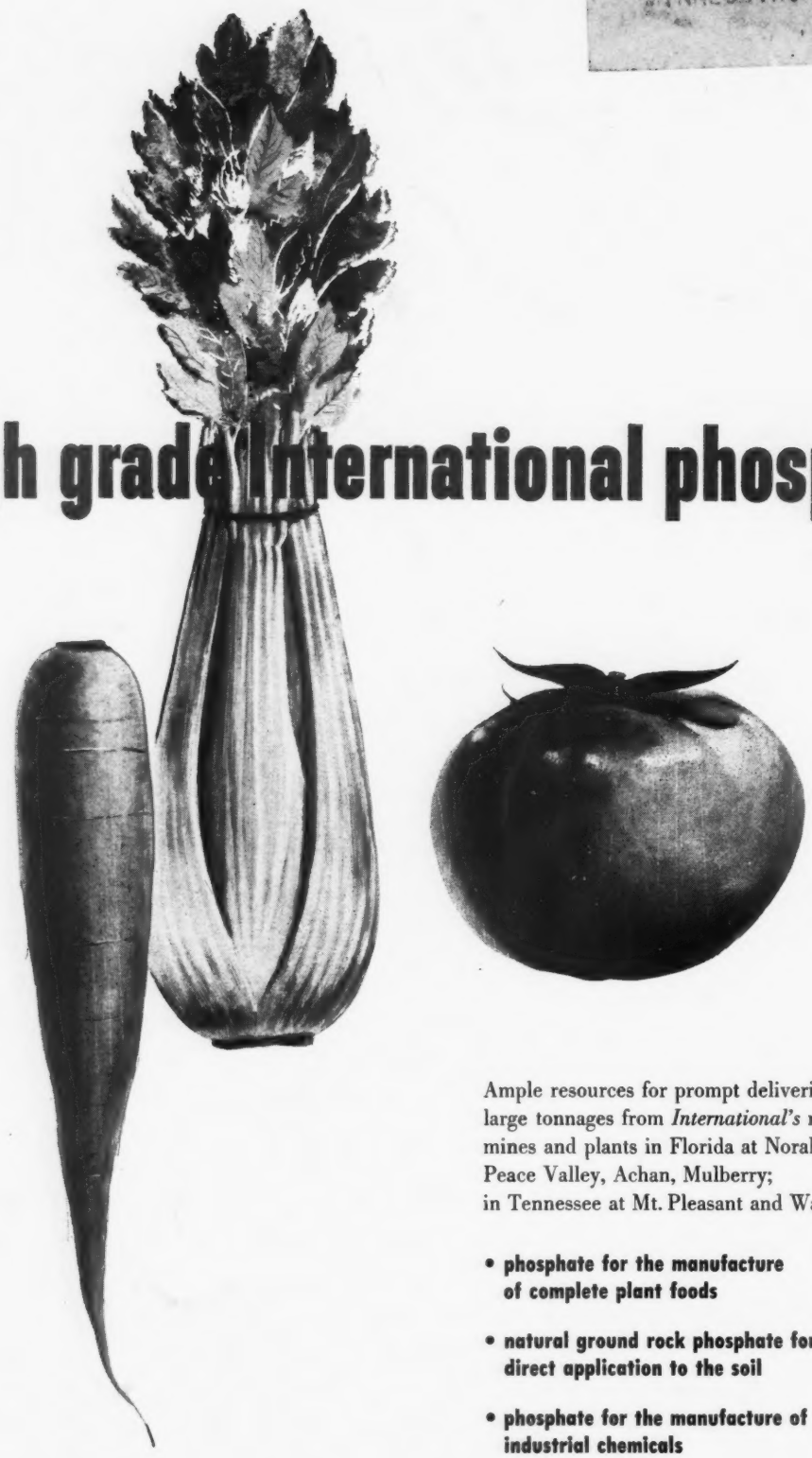
PROFITABLE PASTURES

People who know estimate that as a result of the Green Pastures program hundreds of thousands of acres of low-productive land are now in the profit-producing class. There is still vast acreage to be redeemed by the intelligent use of grassland farming methods.

P. C. A. will make every effort this year to encourage the Green Pastures program.

POTASH COMPANY OF AMERICA
Carlsbad, New Mexico
GENERAL SALES OFFICE...1625 Eye St., N. W., Washington, D. C.
MIDWESTERN SALES OFFICE...First National Bank Bldg., Peoria, Ill.
SOUTHERN SALES OFFICE...Candler Building, Atlanta, Ga.

High grade International phosphates



Ample resources for prompt deliveries of large tonnages from *International's* modern mines and plants in Florida at Noralyn, Peace Valley, Achan, Mulberry; in Tennessee at Mt. Pleasant and Wales.

- **phosphate for the manufacture of complete plant foods**
- **natural ground rock phosphate for direct application to the soil**
- **phosphate for the manufacture of industrial chemicals**

International MINERALS & CHEMICALS phosphate division

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

General Offices: 20 North Wacker Drive, Chicago 6